



NATIONAL INSTITUTE OF TECHNOLOGY MEGHALAYA



5th
ANNUAL REPORT
2015-16

NATIONAL INSTITUTE OF TECHNOLOGY MEGHALAYA

BIJNI COMPLEX, LAITUMKHRAH, SHILLONG 793003



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The Vision:

A Centre of Excellence vibrant with academic activities and bubbling with youthful creative energy, making significant contribution to the World of Knowledge and Technology and to the Development of the State, the Region and the Nation.

The Mission:

- To impart quality education in the fields of Engineering, Science and Technology at Undergraduate as well as Postgraduate levels with special attention to encourage innovation and creativity in these fields.
- To engage in creation of knowledge and development of technologies through effective research programs.

The Guiding Principles:

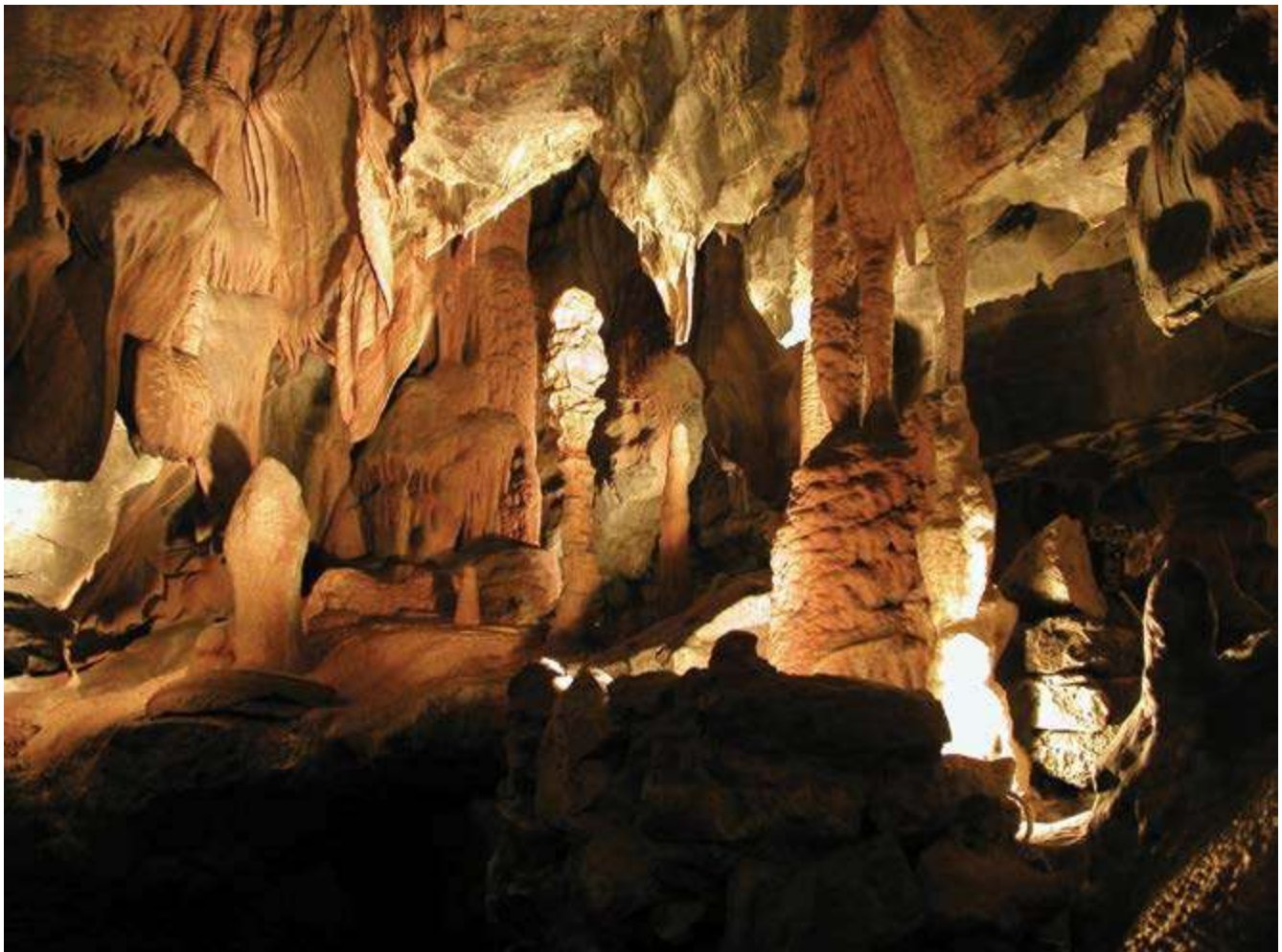
- Every entity deserves respect; responsiveness, fairness and transparency are keys to it.
- Role of an academic institution is to enable unhindered exchange of knowledge.
- True education promotes the spirit of enquiry.
- Nurturing of talent and promotion of creativity must for achieving excellence.
- Learning is a lifelong process.
- Examination and evaluation processes are tools to enable better learning, not the ends.
- Every effort should be made to take the benefit of science and technology to the poor and underprivileged.
- Rural development is must for balanced development of the nation.
- Protection of the environment must get priority.



The Code of Ethics:

The Institute follows the IEEE code of ethics for research:

- To accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment.
- To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist.
- To be honest and realistic in stating claims or estimates based on available data.
- To reject bribery in all of its forms.
- To improve understanding of technology, its appropriate application, and potential consequences.
- To maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations.
- To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others.
- To treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin.
- To avoid injuring others, their property, reputation, or employment by false or malicious action.
- To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.



The Institute:

Permanent Campus Location: Cherrapunjee, East Khasi Hills, Meghalaya
Present Location: Bijni Complex, Laitumkhrah, Shillong- 793003, Meghalaya
Website: www. nitm.ac.in

The Authorities:

Visitor: Shri Pranab Mukherjee, The Hon'ble President of India

Board of Governors:

- Prof. D. K. Basu, Chairman
- Director, IIT Guwahati, Member
- Prof. S. Sengupta, Applied Physics, Professor Calcutta Univ, Member (till 30.08.2015)
- Prof. U. Bhattacharyya, CSE, IEST, Kolkata, Member (till 30.08.2015)
- Shri W. Roy, MD, Meghalaya Power Carriers (India) Pvt. Ltd, Member
- Shri R. D. Shira, FIE, Director, BRPL (Retd.), Member
- Prof. P. S. Choudury, Professor, NIT Meghalaya, Member (from 19.04.2015)
- Addl. Secretary(TE)/ Jt. Secretary(TE), MHRD, Member
- Financial Adviser, MHRD, Member
- Professor D. K. Saikia, Director, NIT Meghalaya, Member
- Registrar, NIT Meghalaya, Secretary

Senate:

- Prof. D. K. Saikia, Director, NIT Meghalaya, Chairman
- Prof. R. S. Sirohi, Former Director, IIT Delhi
- Prof. B. P. Sinha, ACMU, ISI, Kolkata, Member (till 15.12.2015)
- Prof. S. S. Khare, Retd. Mathematics, NEHU, Member (till 15.12.2015)
- Padmashree H. Giri, Retd. Professor, Fine Arts, NEHU, Member (till 15.12.2015)
- Prof. D. Chakraborty, Dean, R&D, IIT Guwahati, Member (till 15.12.2015)
- Prof. S. M. Hazarika, CSE, Tezpur University, Member (till 15.12.2015)
- Dr. P. Bharali, FIE, FIETE, Retd. Director (Operations), Oil India Ltd. (from 06.10.2015)
- Prof. P. K. Basu, Retd. Professor (Retd.), Univ. of Calcutta, Member (from 01.01.2016)
- Prof. P. Majumdar, Civil Engineering, IISc Bangalore, Member (from 01.01.2016)

- Prof. P. Mahanta, Mechanical Engineering, IIT Guwahati, Member (from 01.01.2016)
- Dr. (Mrs) M.P.R Lyngdoh, Former Principal, Shillong College, Member (from 01.01.2016)
- Professors of NIT Meghalaya, Members
- Registrar, NIT Meghalaya, Secretary

Finance Committee:

- Prof. D. K. Basu, Chairman
- Director, NIT Meghalaya, Member
- Jt. Secretary (TE), MHRD or his nominee, Member
- Finance Adviser, MHRD or his nominee, Member
- Prof. S. Sengupta, Calcutta University, Member (till 30.08.2015)
- Shri A. Datta, Asst. Professor, NIT Meghalaya (till 18.04.2015)
- Prof. P. K. Bora, IIT Guwahati, (from 14.09.2015)
- Shri W. Roy, MD, Meghalaya Power Carriers (India) Pvt. Ltd, Member (from 14.09.2014)
- Registrar, NIT Meghalaya, Member Secretary

Building & Works Committee:

- Director, NIT Meghalaya, Chairman
- Prof. A. Dutta, Dean of Institute Works, IIT Guwahati, Member (till 30.11.2015)
- Sri L. Roy, Chairman, Meghalaya State Pvt. Univ. Regulatory Board, Member (till 30.11.2015)
- Prof. S. K. Deb, IIT Guwhati, Member (from 01.12.2015)
- Shri C. D. Saio, Chief Tech Adviser to Power Dept, Govt. of Meghalaya, Member (from 1.12.2015)
- Sri E. B. Kharmujai, Addl. Chief Engineer(EZ), MeECL, Member (from 09.11.2013)
- Sri W. Marbaniang, SE(Design), MPWD(Buildings), Member (from 15.09.2013)
- Director (NITs), MHRD, Member
- Registrar, NIT Meghalaya, Secretary

Administration:

Director: Professor D. K. Saikia

Assoc. Dean (Academic):	Dr. A. Dandapat	Head, Mathematics:	Dr. T. Subedi
Assoc. Dean (R & C):	Dr. A. Bhattacharjee	Head, HSS:	Dr. P. S. Mangang
Assoc. Dean (Students):	Dr. S. Mukherjee	Registrar:	Sri D. J. Goswami (till Feb, 2016)
Head, CSE:	Dr. R. Ray	Asst. Registrar (Estt.):	Sri B. Blahwar
Head, ECE:	Dr. A. Dandapat	Asst. Registrar (F&A):	Sri. J. B. Phanwar
Head, EEE:	Dr. A. Banerjee	Asst. Registrar (Acad.):	Ms. A. Rai
Head, ME:	Dr. D. K. Sarma	Exec. Engineer:	Sri R. L. Kharpran
Head, CE:	Dr. M. Khwairakpam	Asst. Librarian:	Sri. R. Kharbihkhiew
Head, Physics:	Dr. A. Bhattacharjee		
Head, Chemistry:	Dr. G.K. Dutta		



The Director's Report

The National Institute of Technology Meghalaya is currently operating from its temporary campus at the Bijni Complex, Laitumkhrak in Shillong.

The Institute has completed six years of its existence since its establishment in the year 2010. During the year 2015-16 the Institute made significant strides.

The second batch of B. Tech students of the Institute graduated in June, 2015. Eighty students graduated in the three disciplines of Computer Science and Engineering, Electronics and Communication Engineering and Electrical and Electronics Engineering. About 95% of the qualified students were placed in reputed companies through campus placement. The successful students were awarded their degrees in the second convocation of the Institute that was held on 19th October, 2015. The renowned space scientist Padma Vibhushan Dr. Krishnaswamy Kasturirangan graced the occasion as the Chief Guest.



The Institute expanded its postgraduate programme by starting M. Tech programme in the two new specializations of Mechanical Engineering (Fluids and Thermal Engineering) and Civil Engineering (Water Resource Engineering) and M. Sc. programme in Physics, Chemistry and Mathematics. The Institute offered the following academic programmes during the year:

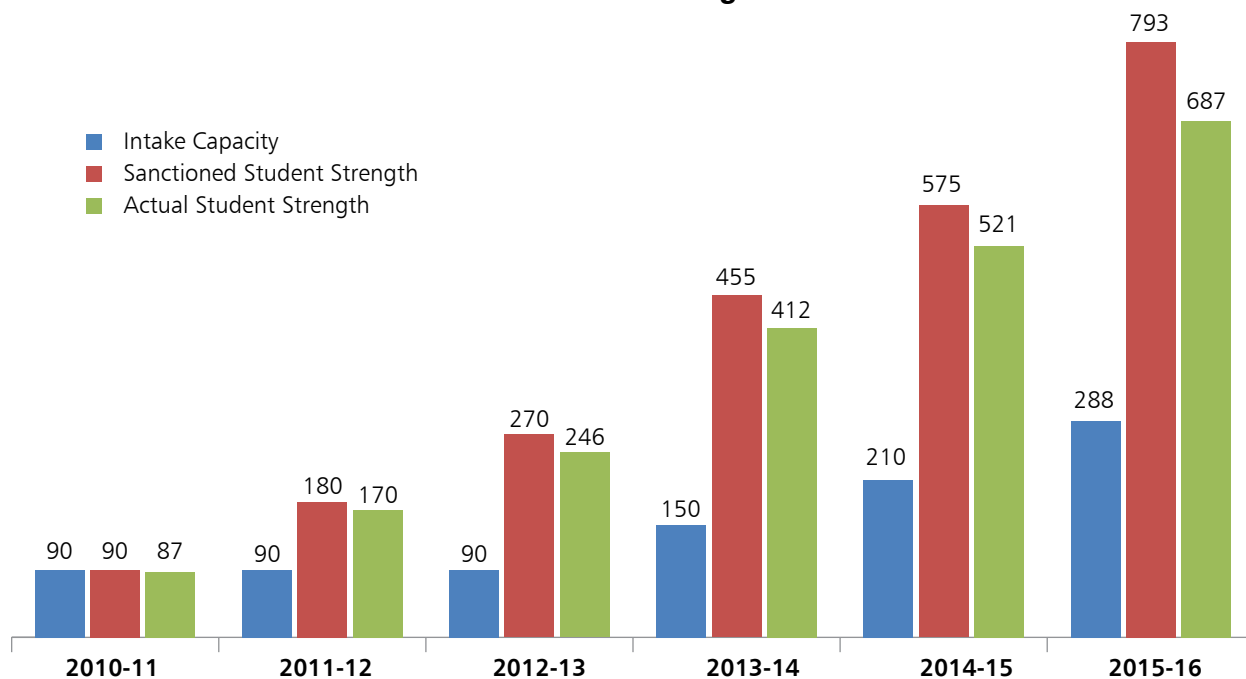
- The B. Tech programme in the five disciplines of- Computer Science and Engineering, Electronics and Communication Engineering, Electrical and Electronics Engineering, Civil Engineering and Mechanical Engineering.
- The M. Tech programme in the five disciplines of- Computer Science and Engineering, Electronics and Communication Engineering (VLSI, Communication Systems), Electrical Engineering (Power and Energy Systems), Mechanical Engineering (Fluids and Thermal Engineering), Civil Engineering (Water Resource Engineering).
- M. Sc. programme in the three disciplines of- Physics, Chemistry and Mathematics.
- PhD programme in all the disciplines.

With these the intake capacity of the Institute increased to 288 for total student capacity of 793 in addition to the PhD scholars. To cater to the increased need the faculty strength was increased to 67. The student strength in the various programmes in the Institute during the year are-

Program	Discipline	Year of Starting	Intake Capacity	Admitted in 2015-16						Total Strength					
				M	F	SC	ST	OBC	Total	M	F	SC	ST	OBC	Total
B. Tech	Electronics and Communication Engineering	2010	30	18	8	2	13	3	26	82	21	9	34	20	103
	Electrical and Electronics Engineering	2010	30	22	5	4	13	4	27	88	23	17	42	26	111
	Computer Science and Engineering	2010	30	20	6	3	13	4	26	89	17	12	35	21	106
	Mechanical Engineering	2013	30	27	0	3	13	5	27	80	4	9	38	18	84
	Civil Engineering	2013	30	22	4	2	14	5	26	71	13	8	43	17	84
	Sub Total		150	109	23	14	66	21	132	410	78	55	192	102	488
M. Tech	Computer Science and Engineering	2014	20	12	4	3	2	4	16	26	7	6	5	7	33
	Electronics and Communication Engineering	2014	20	8	7	3	3	4	15	23	10	6	4	11	33
	Electrical Engineering	2014	20	11	2	3	1	2	13	18	8	6	4	2	26
	Mechanical Engineering	2015	15	12	1	2	0	5	13	12	1	2	0	5	13
	Civil Engineering	2015	15	6	0	0	1	2	6	6	0	0	1	2	6
	Sub Total		90	49	14	11	7	17	63	85	26	20	14	27	111
M. Sc.	Physics	2015	16	7	4	0	5	0	11	7	4	0	5	0	11
	Chemistry	2015	16	3	10	1	0	4	13	3	10	1	0	4	13
	Mathematics	2015	16	3	3	0	5	0	6	3	3	0	5	0	6
	Sub Total		48	13	17	1	10	4	30	13	17	1	10	4	30

Program	Discipline	Year of Starting	Admitted in 2015-16						Total Strength					
			M	F	SC	ST	OBC	Total	M	F	SC	ST	OBC	Total
PhD	Electronics and Communication Engineering	2013	6	1	1	0	2	7	9	1	1	0	2	10
	Electrical and Electronics Engineering	2013	2	0	0	0	0	2	7	3	1	0	2	10
	Computer Science and Engineering	2013	4	1	0	2	1	5	9	3	0	3	2	12
	Mechanical Engineering	2013	3	1	0	0	1	4	7	1	1	0	3	8
	Civil Engineering	2013	1	2	0	1	1	3	5	4	1	5	2	9
	Physics	2013	0	0	0	0	0	0	3	0	0	1	0	3
	Chemistry	2013	0	0	0	0	0	0	1	0	0	1	0	1
	Mathematics	2013	2	0	0	0	0	2	2	0	0	0	0	2
	Humanities	2013	0	0	0	0	0	0	2	1	0	1	1	3
	Sub Total		18	5	1	3	5	23	45	13	4	11	12	58

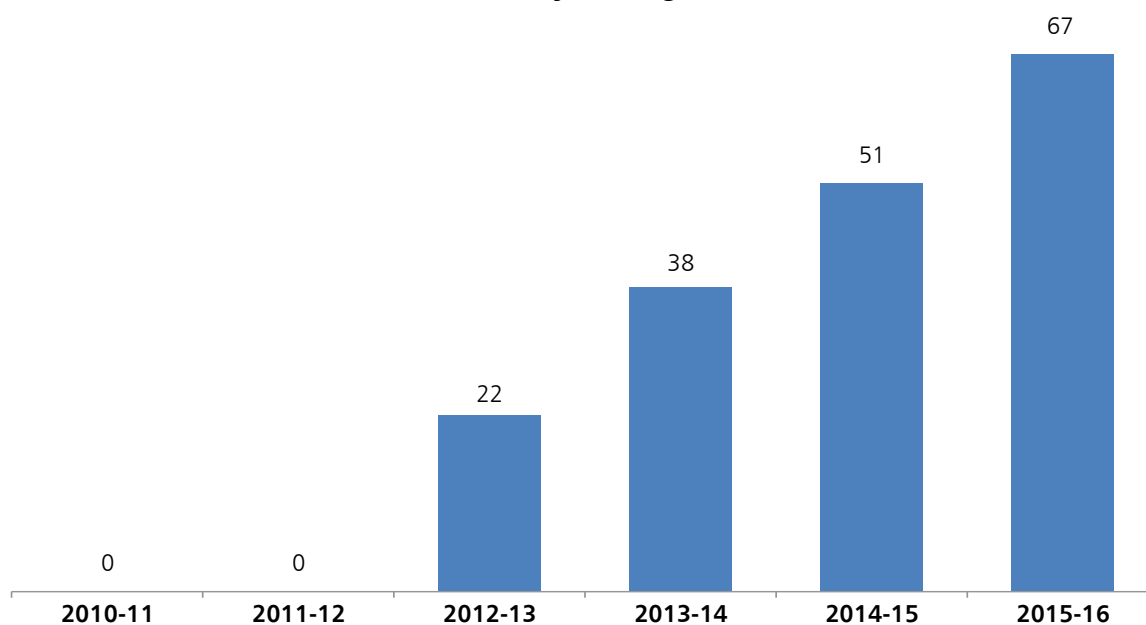
Students Strength



The Institute waives the tuition fees of the students of the ST and SC categories. It also provides *merit free studentship* with the waiver of tuition fees for top performing 5% of the students and *merit-cum-means free studentship* scheme with similar waiver for another 5% of the students of weak economic background. All the M. Tech students are GATE qualified and they receive fellowships as do the PhD scholars. A good fraction of the remaining students of the Institute also receive scholarships from various agencies.

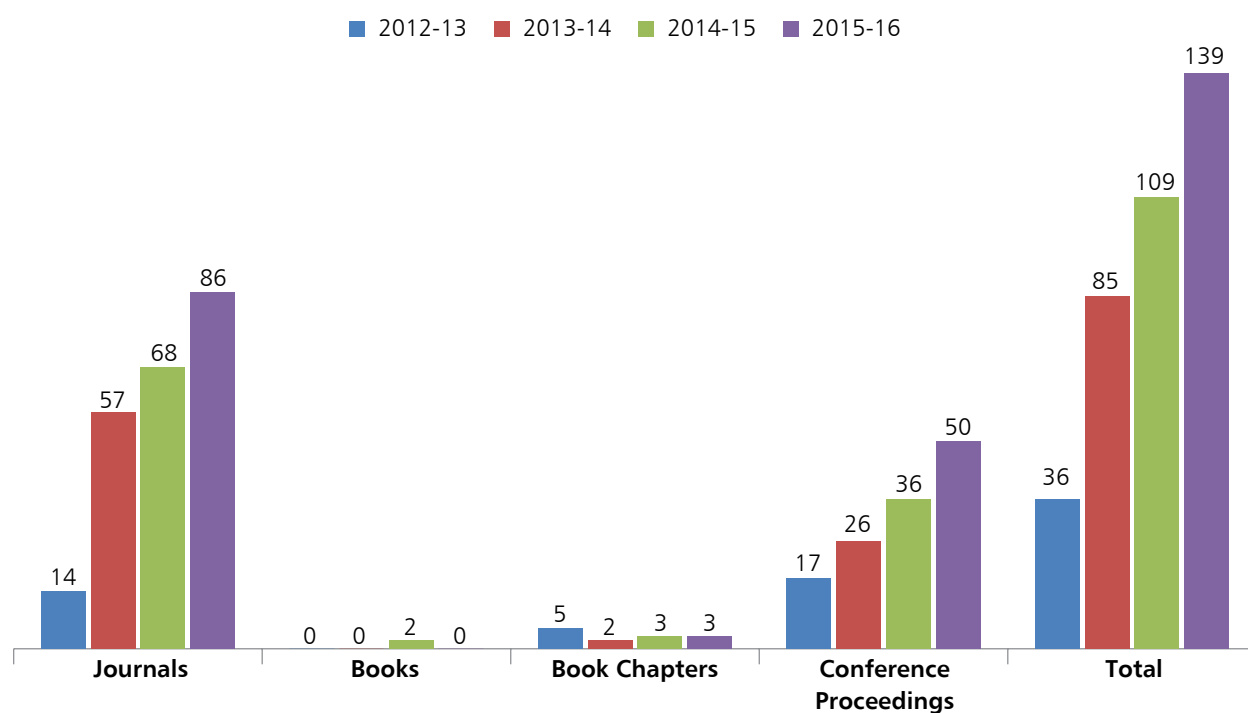
The Institute has been able to attract very good quality faculty from premier institutions all over the country as well as abroad. About two third of the faculty members hold PhD degrees and the remaining are pursuing the doctoral studies.

Faculty Strength



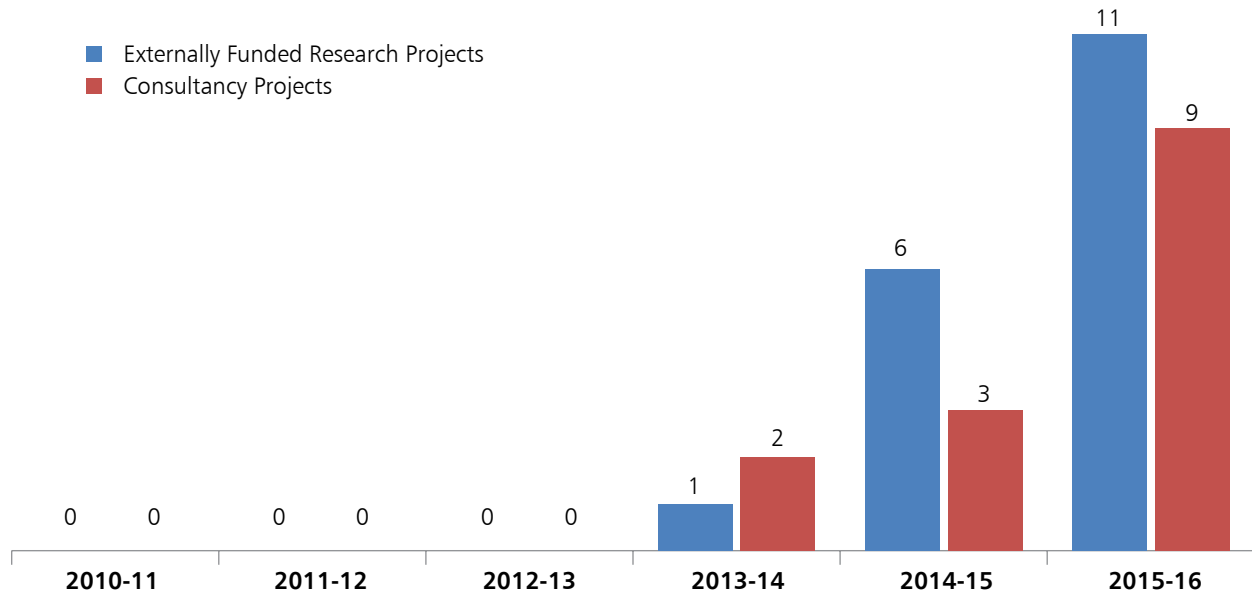
The departments have been vibrant with academic activities and the faculty members have been actively pursuing their research. There were a total of 139 peer reviewed research publications by the faculty- 86(eighty six) in international journals, 3(three) book chapters, 50(fifty) in international conferences. One Indian patent was also filed by a faculty member.

Publications



The Faculty received 11(eleven) sponsored research projects from various funding agencies during the year. The faculty members have also been providing consultancy services to their areas of expertise to the various Govt. as well as private sector agencies. Nine consultancy projects were also taken-up by the faculty during the period.

Sponsored Projects Received



An IEEE sponsored International Conference and a good number of workshops sponsored by industry and funding agencies were organized by the departments. There have been regular fortnightly institute seminars with talks delivered by the faculty and the scholars for interdisciplinary interactions.



Students Activities:

The students, in addition to their academics, engaged themselves with various extracurricular activities such as sports and games, cultural activities, elocution, technology clubs, NSS activities etc. The students of the Institute also participated in inter-institutional sports, cultural and elocution event in different parts of the country and brought laurels to the Institute.

Technical Festival (Cognitia):

The Students Council organized the Third Technical Festival Cognitia 2015 in October, 2015. There were many competitive events such as- robotics, structural design, mechanical design, circuitry design, programming, quizzes etc. In addition to these there were several invited talks, workshops also organized during the event.



Cultural Activities:

The Third Annual Cultural Festival of the Institute Shishir-2016 was organized in with full enthusiasm. Students competed in various cultural events such as dance, music, drama etc. with fun and fare to explore and hone their talents.



Sports & Games:

The Sports and Games competitions were organized throughout the year.



NSS:

The NSS unit of the Institute was busy with events such as blood donation camps, tree plantation, neighbourhood cleanliness program etc.



Students Placement:

The placement of the first batch of B. Tech students was taken up with high priority. The Institute could bring a good number of companies for recruitment.

Discipline	Placement Percentage	
	Overall	Among Qualified Students
Computer Science and Engineering	65%	100%
Electronics and Communication Engineering	64%	95%
Electrical and Electronics Engineering	50%	67%
Total	59%	85%

Recruiting Companies:

Nucleus Software, IBM, Nokia, Polaris, Tech Mahindra, Infosys, L&T, Ericsson, Wipro, Vodafone, HP etc.

The placement unit also made arrangements for internships for the students in the industries and research institutions in the country.

Permanent Campus:

The construction activities in the permanent campus of the Institute at Cherrapunjee have been making good progress. The Project Management Consultancy (PMC) work for the Phase-I constructions of the permanent campus of the Institute at Sohra (Cherrapunjee) was awarded to the central PSU under the Ministry of Railways M/S RITES Ltd. In this first phase of constructions for a built-up space of about one lakhs square meters construction works in three packages of Academic, Administrative, Residential buildings, Sports Complex etc. are being carried out. The Institute plans to shift to the permanent campus at the end of 2017.



ACADEMIC DEPARTMENTS

Computer Science and Engineering

The Department of Computer Science and Engineering at NIT Meghalaya has adequate facilities to support teaching activities needed for a batch of 30 students. It has a well qualified and experienced faculty team consisting of 12 faculty members. The Computer Science & Engineering department makes all efforts in imparting high quality education to its motivated students. One of the aims of this department to play its role of producing Computer Engineers ready to satisfy the needs of the Computer and IT world. The Department is also actively involved in various research activities. The research areas of the department broadly include Formal Methods in Systems Verification, Natural Language Processing, Reversible Computing, Embedded Systems, Computer Networks, Network Security, Image Processing and Theoretical Computer Science.

2. Programmes Offered:

The Department of Computer Science & Engineering offers the B. Tech programme, the full-time M.Tech programme and the PhD programme (full-time and part-time).

3. Faculty Profile:

Name	Designation	Qualification	Date of Joining	Specialization	Remarks	PhD Guidance
Dr. Dilip Kr. Saikia	Professor	PhD (IIT Kharagpur)	01.11.2011	Networks, Security	Director	Completed-6 Ongoing-4
Dr. Alok Chakrabarty	Assistant Professor	PhD (Assam Univ.)	20.06.2012	Pattern Recognition, Data Mining		
Dr. Rajarshi Ray	Assistant Professor	PhD Verimag, Univ. of Grenoble, France.	03.09.2013	Formal Methods	Head of Department	Ongoing-2
Dr. Kamalika Datta	Assistant Professor	PhD (IEST)	31.07.2014	Reversible and Quantum Computing	Chairman, International Collaborations	Ongoing-2
Dr. Sanjoy Pratihar	Assistant Professor	PhD (IIT Kharagpur)	25.08.2014	Digital Geometry, Computer Vision		Ongoing-1
Ms. Surmila Thokchom	Assistant Professor	M. Tech (Tezpur Univ.) Pursuing PhD	26.09.2012	Network Security, Cloud Computing		-
Mr. Nabajyoti Medhi	Assistant Professor	M. Tech (Tezpur Univ.) Pursuing PhD	19.12.2012	Computer Networks	Faculty I/C, Computer Center	
Mr. Deepak Kumar	Assistant Professor	M. Tech (BESU) Pursuing PhD	20.12.2012	Digital Systems		-
Mr. Manjish Pal	Assistant Professor	M. Tech (IIT Kanpur)	07.08.2013	Theoretical Computer Sc, WSN		-
Mr. Akhilendra Pratap Singh	Assistant Professor	M. Tech (MNNIT) Pursuing PhD	03.09.2013	Service Oriented Network Architecture	Faculty Adviser, Students Council	-
Mr. Ansuman Bhattacharya	Assistant Professor	M. Tech, PhD Thesis Submitted	04.08.2016	Wireless Comm. and Networks	T&P Dept. Coordinator	
Mr. Alope Datta	Assistant Professor	M. Tech, Pursuing PhD	25.08.2014	Image Processing, Pattern Recognition		-
Ms. Sukanya Bhattacharjee	Trainee Teacher	Pursuing M. Tech at IIT Guwahati	20.07.2015	Computational Geometry		-
Mr. Nihal Jain	Trainee Teacher	Pursuing M. Tech at IIT Guwahati	20.07.2015	Data Mining		-

4. List of publications:

a. Journals:

- i. **A. Bhattacharya**, R. Ghosh, K. Sinha, D. Datta, B. P. Sinha, "Non-Contiguous Channel Allocation for Multimedia Communication in Cognitive Radio Networks", IEEE Transactions on Cognitive Communications and Networking (Accepted).
- ii. **A. Bhattacharya**, K. Sinha, D. Datta, B. P. Sinha, "MRBNS: A New Energy-Efficient Communication Scheme in Low Power Wireless Networks", International Journal of Sensor Networks (Accepted).
- iii. **A. Bhattacharya**, P. Majumder, K. Sinha, B. P. Sinha, K. V. N. Kavitha, "An Energy-Efficient Wireless Communication Scheme using Quint Fibonacci Number System", in International Journal of Computer Networks and Distributed Systems (Inderscience), vol. 16 no. 2, pp. 140-161, Feb. 2016.
- iv. **A. Datta**, S. Ghosh and A. Ghosh, "Combination of Clustering and Ranking Techniques for Unsupervised Band Selection of Hyperspectral Images", IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, Vol. 8, No. 6, pp. 2814-2823, 2015.
- v. **Sanjoy Pratihari** and Partha Bhowmick, "Fast and Direct Polygonization for Gray-Scale Images Using Digital Straightness and Exponential Averaging", International Journal of Image and Graphics, Vol. 16, No. 4, Art. 1650007 (36 pages), 2016.
- vi. A. Koley, **K. Datta** and I. Sengupta, "A Heuristic for Linear Nearest Neighbor Realization of Quantum Circuits by SWAP Gate Insertion Using N-Gate Lookahead", IEEE J. Emerg. Sel. Topics Circuits Syst., Vol.-6, Issue No.-1, pp -62-72, 2016.
- vii. P. Saha, and **D. Kumar**, "A new algorithm for the computation of the decimals of inverse", Scientia Iranica journal, accepted on Feb 2016, ISSN: 1026-3098.
- viii. I. Hussain, Z. I. Ahmed, N. Sarma, **D. K. Saikia**, An Efficient TDMA MAC Protocol for Multi-hop WiFi-Based Long Distance Networks, Wireless Personal Communication, Vol. 86, No. 4, pp 1971-1994, January, 2016.
- ix. H. Choudhury, B. Roychoudhury, **D. K. Saikia**, Security Extension for Relaxed Trust Requirement in Non3GPP Access to the EPS, International Journal of Network Security, Vol. 18, No. 6, pp 1041-1053, 2016.
- x. H. Choudhury, B. Roychoudhury, **D. K. Saikia**, Enhanced Identity Privacy in UMTS, International Journal of Ad Hoc and Ubiquitous Computing, Inderscience (Accepted).
- xi. I. Hussain, Z. I. Ahmed, N. Sarma and **D. K. Saikia**, A QoS-aware Dynamic Bandwidth Allocation Scheme for Multi-hop WiFi-based Long Distance Networks, EURASIP Journal on Wireless Communications and Networking, June, 2015, DOI: 10.1186/s13638-015-0352-z.

b. Book Chapters:

- i. **Rajarshi Ray**, **Amit Gurung**, Binayak Das, Ezio Bartocci, Sergiy Bogomolov and Radu Grosu, "XSpeed: Accelerating Reachability Analysis on Multi-core Processors", LNCS, Vol. 9434, pp. 3-18 (2015).

c. Conferences:

- i. C. Lalengmawia, **A. Bhattacharya**, **A. Datta**, Image Stenography using Advanced Encryption Standard for implantation of Audio/Video Data, to appear in Proc. International Conference on Recent Trends in Information Technology, IEEE ICRTIT, 8-9 Apr. 2016 (Third Best Paper).
- ii. K. Sinha, B. Gupta, S. Rahimi, **A. Bhattacharya**, "Candidate Core Selection for Load-Balanced Multicore Shared Tree Multicasting", in Proc. International Conference on Recent Advances in Information Technology (IEEE RAIT), 3-5 Mar. 2016.
- iii. **A. Bhattacharya**, S. Audhya, K. Sinha, "An Anti-Jamming Protocol Based on Secret Reallocation of Channels", in Proc. International Conference on Recent Advances in Information Technology (IEEE RAIT), 3-5 Mar. 2016.
- iv. D. Das, and **A. Chakrabarty**, "Human Gait Recognition using Deep Neural Networks," Proc. 2nd International Conference on ICT for Competitive Strategies (ICTCS 2016), 4-5 March 2016, Computer Society of India Udaipur, India, ACM - ICPS.
- v. **A. Chakrabarty**, C. Lalengmawia, K. P. Sharma, D. Das, and N. Das, "On processing of Abbreviations, Stop Words and Transliterations for classification of Twitter topics," Proc. International Conference on Microelectronics, Computing and Communication (MicroCom 2016), 23-25 January 2016, NIT Durgapur, India, IEEE Publications.
- vi. **A. Chakrabarty**, and N. Das, "Assessment of values of time-domain and frequency domain parameters for ECG signals through HRV analysis using Symlets for Arrhythmia prediction," in Advances in Computational Intelligence: Proc. International Conference on Computational Intelligence 2015, 10-11 December 2015, BIT Mesra, Ranchi, India, Springer.

- vii. P. M. N. Rani, **K. Datta**, and **A. Chakrabarty**, "Synthesis of Ternary Reversible Circuits: A Group Theoretic Approach" in ACM-W workshop on Regional Celebration of Women in Computing, East and North-East (ACMW 2015), 2-3 November 2015, IIT Guwahati, India.
- viii. D. Das, and **A. Chakrabarty**, "Human Gait Based Gender Identification System Using Hidden Markov Model and Support Vector Machines," Proc. IEEE International Conference on Computing, Communication and Automation (ICCCA 2015), IEEE Publications, May 2015, pp. 268-272. [Online].
- ix. A. Kumar and **A. Datta**, "Adaptive Edge Discriminated Median Filter To Remove Impulse Noise", Proceedings of IEEE International Conference on Computing, Communication and Automation (ICCCA 2016), Delhi, India, pp., 2016.
- x. **Sanjoy Pratihari** and Najima Begum, Understanding Shape Context by Analysis of Farey Ranks, Proc. 5th International Conference on Informatics, Electronics and Vision, The University of Dhaka, Dhaka, (to be published by IEEE press), May 13-14, 2016.
- xi. F. Lachhandama, B. Sapui, **K. Datta**, An improved approach for the synthesis of Boolean functions using memristor based IMPLY and INVERSE-IMPLY gates, IEEE Computer Society Annual Symposium on VLSI (ISVLSI-2016), Period -July, Place -Pittsburgh, Pennsylvania, U.S.A (Accepted), 2016.
- xii. **Nabajyoti Medhi**, **Manjish Pal**, "Sixsoid: A new paradigm for k-coverage in 3-D wireless sensor networks", ICCCS 2015, IEEE Mauritius, Dec 2015.
- xiii. Chaitanya Buragohain and **Nabajyoti Medhi**, "FlowTrApp: A SDN based Architecture for DDoS Attack Detection and Mitigation", 3rd International Conference on Signal Processing and Integrated Networks (SPIN 2016), Feb 2016.

5. Sponsored Projects:

Sl. No.	Project Title	Investigators	Funding Agency	Funding Amount (INR)	Project Status	Duration
1.	Special Manpower Development Project (SMDP)	Dr. Rajarshi Ray	DeitY	94.00 Lakhs	Ongoing	5 yrs
2.	Development of Cross Lingual Information Access System (CLIA) - Phase II	Dr. Alok Chakraborty	DeitY	70.84 Lakhs	Completed	5 yrs
3.	Dynamic Reconfigurable implementation of cryptographic algorithms on FPGA platform	Dr. Kamalika Datta	DeitY	15.00 Lakhs	Ongoing	1 yr
4.	Efficient multi-dimensional qubit placement in quantum circuits.	Dr. Kamalika Datta	DST-SERB	14.82 Lakhs	Ongoing	3 yrs
5.	Parallel Model Checking of Hybrid Systems.	Dr. Rajarshi Ray	DST	22.38 Lakhs	Ongoing	3 yrs

6. Conference/ workshop/ seminar organized:

Sl. No.	Title	Sponsors	Resource Persons
1	National workshop on Security Issues in Cloud and Machine to Machine Communication (NWSICM), 27-28 August, 2015. (Organizing Co-Chair: Mrs. Surmila Thokchom)	DST, DeitY	Prof. R K Shyamasundaram, IIT Mumbai, Prof. I. Sengupta, IIT Kharagpur, Prof. K. Paul, IIT Delhi, Prof. C. Mazumdar, Jadavpur Univ, Prof. D. K. Bhattacharyya, Tezpur Univ.
2	NMEICT Awareness Workshop, 25-26 September 2015. (Organizing Chair: Dr. Rajarshi Ray)	MHRD	Prof. N. K. Singh, IIT Kanpur Prof. R. Datta, IIT Kharagpur Dr. A. Banerjee, ISI, Kolkata Dr. Santosh Biswas, IIT Guwahati Dr. Wasim Arif, NIT Silchar A-View Team, Amrita Univ, Coimbatore



7. Seminars/Workshops/Conferences Attended by the faculty members:

i. Dr. Alok Chakrabarty

- Attended the workshop "Accreditation and Transformation of Technical Education to OBE" January 22-23, 2016 at National Institute of Technology Meghalaya, Shillong
- Participated in a two-day tutorial workshop titled "Workshop on Big Data Analytics (WBDA '15)", August 20-21, 2015 at Indian Statistical Institute, Kolkata.
- Participated in tutorial workshop titled "Nature Inspired Computing for Engineering Applications", April 6-8, 2015 in Indian Institute of Science, Bangalore.

ii. Mr. A. P. Singh

- Second National Workshop On Simulation of Image, Audio & Video with Matlab, OpenCV and Documentation with Latex (SIMDOC-2015) at MNNIT Allahabad.

iii. Dr. Rajarshi Ray

- Presented paper at the International Haifa Verification Conference (HVC), IBM Research Labs, Haifa, Israel, November, 17-19 2015.
- Attended as a Fellow the International Conference on VLSI Design and associated tutorials, Kolkata, 4-8 January.
- Attended the workshop "Accreditation and Transformation of Technical Education to OBE" January 22-23, 2016 at National Institute of Technology Meghalaya.
- Invited to participate in the Mysore Park Workshop on "Trends and Challenges in Quantitative Verification", organized by S. Akshay, Joost-Pieter Katoen, B. Srivathsan, and Igor Walukiewicz, February 1-4, Mysore 2016.

iv. Mr. D. Kumar

- "Accreditation and Transformation of Technical Education to OBE" on 22-23 January 2016 held at NIT Meghalaya.

v. Mr. Nabajyoti Medhi

- Presented paper in ICCCS 2015 held in Mauritius, Dec 4-6, 2015
- Participated in SDN Foundations Workshop held in Bangalore, Jan 29-31, 2016

- Participated in Open Networking India Symposium held in Bangalore, Feb 2016
- Participated first international symposium on 5G held at IIT Patna, March 29-31, 2016.

vi. Mr. Ansuman Bhattacharya

- Accreditation and Transformation of Technical Education to OBE, January 22-23, 2016 at National Institute of Technology Meghalaya.
- Presented papers at the International Conference on Recent Advances in Information Technology (IEEE RAIT), 3-5 Mar. 2016.

8. Laboratories set-up:

- High Performance Computing Laboratory with CDAC PARAM Savak.

9. Any other notable information:

a. Dr. R Ray

- Program Committee member of the 2nd International Workshop on Symbolic and Numerical Methods for Reachability Analysis, 11 April, part of CPS Week, Vienna, Austria, 2016.
- Reviewer in the VLSI Design Conference, January 2016, Kolkata.
- Reviewer in the Xerox Research Center India (XRCI) Open, 2015.
- Reviewer in the VDAT conference, IIT Guwahati, 2016

b. Dr. S. Pratihari

- Program Committee Member of the 17th International Workshop on Combinatorial Image Analysis (IWCIA-2015), Indian Statistical Institute, Kolkata, India.
- Program Committee Member of the 6th International Workshop on Computational Topology in Image Context (CTIC 2016), Marseille, France.
- Reviewer in the IEEE Signal Processing Letters.
- Reviewer in the International Journal of Biomedical Imaging (Hindwai).
- Reviewer in the 17th International Workshop on Combinatorial Image Analysis (IWCIA-2015), Indian Statistical Institute, Kolkata, India.
- Reviewer in the 6th International Workshop on Computational Topology in Image Context (CTIC 2016), Marseille, France.

c. Dr. K Datta

- Reviewer in the Journal of Emerging Technologies in computing Systems (JETC).
- Reviewer of Transaction on Computer Aided Designs (TCAD).
- Reviewer in the Fiber and Integrated Optics journal.
- Reviewer in the IETE Journal of Research.
- Reviewer in the VDAT conference, IIT Guwahati, 2016

d. Mr. Nabajyoti Medhi

- Cleared ONF Certified SDN Associate Certification exam held during SDN Foundations Workshop held in Bangalore and got OCSA (ONF Certified SDN Associate) certified.

e. Mr. Ansuman Bhattacharya

- Reviewer of IEEE Transaction on Mobile Computing.
- Reviewer of IEEE Transaction on Vehicular Technology.
- Technical Program Committee Member of Twenty Second IEEE National Conference on Communications 2016.
- Communications 2016. Communications 2016.

Department of Electronics & Communication Engineering

1. Brief Introduction to the Department:

The Department of Electronics and Communication Engineering (ECE) was established in 2010 with the inception of National Institute of Technology Meghalaya. The department offers B. Tech Programme with an intake capacity of thirty & M. Tech Programme with an intake capacity of twenty in Electronics and Communication Engineering and Ph.D. program in various specialized areas of Electronics and Communication Engineering. The major research areas of the department include High Speed and Low Power VLSI, Computer Arithmetic, Wireless Sensor Networks, Cognitive Radio, Antenna Design, Signal Processing and MEMS. The major objective of the Department is to impart high quality technical education and research with a strong foundation in Electronics and Communication Engineering.

The major areas of faculty expertise of the department include VLSI Systems, Microelectronics & MEMS, High Performance Computing, Signal and speech Processing, Digital Signal Processing, Communication and RF & Microwaves Engineering.

2. Programmes Offered:

- I. B. Tech in Electronics and Communication Engineering (Full-time)
- II. M. Tech in Electronics and Communication Engineering (Full-time)
- III. Ph. D (Full-time/ Part-time)

3. Faculty Profile:

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Dr. Anup Dandapat	PhD (Jadavpur Univ)	Associate Professor	Low Power VLSI, Low Power Digital Circuits, Low Power High Speed Multipliers, Low Power High Speed Memories.	20.12.2012	Awarded – 2, Pursuing – 4
Dr. P. Rangababu	PhD (Hyderabad Central Univ)	Assistant Professor	VLSI Design & Embedded Systems, Medical Electronics, Low Power Multi-Core Scalable Processor, SoC Implementation of CR.	11.08.2014	Pursuing – 1
Dr. Ch. V. Rama Rao	PhD (JNTUH, Hyderabad)	Assistant Professor	Statistical Signal, Speech and Image Processing; Signal Processing Issues in Adv. Comm. Systems; Design and Dev of Adv. Comm. Systems	28.08.2014	Pursuing – 2
Dr. Arnab Nandi (Released on 14.12.2015 A.N.)	PhD (NIT Durgapur)	Assistant Professor	Wireless Sensor Networks (WSNs), Antenna Design	01.09.2014	--
Dr. Prabir Saha	PhD (IIST, Kolkata)	Assistant Professor	Computer Arithmetic, VLSI Design, Digital Signal Processing, VLSI Circuit Optimization Techniques	13.06.2012	Pursuing – 1
Dr. Pradeep Kumar Rathore	PhD (IIT Delhi)	Assistant Professor	Microelectronics & MEMS Sensors and their Fabrication Techniques	11.08.2014	--
Ms. Bishnulatpam Pushpa Devi	ME (Anna Univ) Pursuing PhD (Assam Univ)	Assistant Professor	Signal Processing, Image Processing	03.01.2013	--
Mr. Vinay Kumar	M. Tech (NIT Silchar) Pursuing PhD (NIT Meghalaya)	Assistant Professor	Analog and Digital VLSI Design, Optimization Techniques for Digital Circuits, CMOS Image Sensors, Neural Networks & Its Applications	10.12.2012	--

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Mr. Abhishek Sarkhel	M.E. Pursuing PhD (IIST)	Assistant Professor	Electromagnetism and Antenna Engineering	23.08.2013	--
Mr. Mridupawan Sonowal	M. Tech (IIT Guwahati) Pursuing PhD	Assistant Professor	Information theory and Coding	07.08.2013	--
Ms. Ruchika	M. Tech (IIT Guwahati)	Trainee Teacher	Signal Processing	21.07.2014	--

4. List of publications:

a. Journals:

- Partha Bhattacharyya, B. Kundu, S. Ghosh, Vinay Kumar, and **A. Dandapat**, "Performance Analysis of a Low Power High Speed Hybrid 1 Bit Full Adder Circuit", IEEE Transactions on Very Large Scale Integration Systems, Vol-23, 2015.
- S. Mishra and **A. Dandapat**, "EMDBAM: A Low Power Dual Bit Associative Memory with Match Error and Mask Control", IEEE Transactions on Very Large Scale Integration Systems, Vol.-24, Issue No.-99,2016.
- P. Saha**, D. Kumar, "A new algorithm for the Computation of the Decimals of the Inverse", Scientia Iranica: Transc. D: Computer Science & Engineering and Electrical Engineering, February 2016.
- D. Mitra, B. Ghosh, **A. Sarkhel**, and S. R. B. Chaudhuri, "A Miniaturized Ring Slot Antenna Design With Enhanced Radiation Characteristics", IEEE Transactions on Antennas And Propagation, Vol.-64, Issue No.-1, Page Nos -300–305, 2015.
- A. Sarkhel**, D. Mitra, and S. R. B. Chaudhuri, "A Compact Metamaterial with Multi-band Negative-index Characteristics", Springer: Applied Physics A, Vol.-122, Issue No.-4, Page Nos -122:1-10, 2016.
- Rangababu Peesapati**, "FPGA based System on Chip (SoC) for Space computation", Planex Newsletter, Vol.-6, Issue No.-1, Page Nos -16-20, 2016.

b. Conferences:

- Shashi Kumar, **Pradeep Kumar Rathore** and Jamil Akhtar, A comparative study on p- and n-channel MOSFET embedded pressure sensing structures integrated with current mirror readout circuitry, 2016 IEEE International Students' Conference on Electrical, Electronics and Computer Sciences (SCEECs 2016) held at NIT Bhopal from 5-6 March 2016.
- A. Sarkhel**, S. R. B. Chaudhuri, Design of a compact triple-band metamaterial absorber with wide angle of incidence using connected resonator topology, International Conference on Electromagnetics in Advanced Applications (ICEAA), Period -7-11 Sept., Place -Turin,Italy, Page -1239 - 1242, 2015.
- A. Sarkhel**, S. R. B. Chaudhuri, Design of Miniaturized PIFA with Magnetic Resonator Metamaterial Loading, IEEE Applied Electromagnetics Conference, Period -December 18-21,2015, IIT Guwahati.
- V. Kumar**, C. K. Jha, G. Thapa and **A. Dandapat**, Design of Low Power and High Speed Carry Look Ahead Adder (CLA) Using Hybrid CMOS Logic Style, International Conference on Micro Electronics Electromagnetics and Telecommunications (ICMEET 2015),Page -645-654, Visakhapatnam, Andhra Pradesh, India, December, 2015.
- P. Saha**, P. Samanta, D. Kumar, 4-2 and 5-2 Decimal Compressors, 7th Int. Conf. on Intelligent Systems, Modelling and Simulation (ISMS 2016), Bangkok, Thailand, (Jan-2016).
- Avadhesh Kumar, **Ch V Rama Rao**, Low-power structures of digital matched filter for direct sequence spread spectrum systems, IEEE WISPNET 2016, Period -March 23-25, Place -Chennai, 2016.

5. Sponsored Research Projects:

Sl. No.	Project Title	PI & Co-PI	Funding Agency	Funding Amount (Rs.)	Project Status	Duration
1	Ultra Low Power Multi Array 64KX 16Dual Bit Associative Memory with Partial Matching Capability	Dr. A. Dandapat	DST-SERB	26.3 Lakhs	Ongoing	3 yrs

Sl. No.	Project Title	PI & Co-PI	Funding Agency	Funding Amount (Rs.)	Project Status	Duration
2	Implementation of Cryptographic Algorithms on FPGA Platform for Dynamic Reconfigurability	Dr. K. Dutta, Dr. A. Dandapat, Dr. Rangababu	DeitY	15 Lakhs	Ongoing	1 Yr
3	Special Manpower Development Project (SMDP)	Dr. A. Dandapat, Dr. R. Ray	DeitY	94 Lakhs	Ongoing	5 yrs
4	Design of Reconfigurable. Defected Ground Structure Resonator for Wireless Application	Dr. A. Nandi	DST	22.43 Lakhs	Transferred NIT Silchar in March, 2016	3 Yrs

6. Conference/ workshop/ seminar organized:

Sl. No.	Title	Sponsors	Resource Persons
1	Workshop on Future Challenges in Wireless Communication and Signal Processing, 7-8 Aug, 2015	DST	Prof. S. Nandi, IIT Guwahati, Prof. P. K. Bora, IIT Guwahati, Prof. R. Bhattacharjee, IIT Guwahati, Prof. N. Sarma, Tezpur University, Prof. A. Rajesh, IIT Guwahati

7. Awards won/ Recognition Received:

Dr. A. Dandapat received Young Faculty Research Fellowship under the Special Manpower Development Project

8. Conferences Attended:

Sl. No.	Person	Title of the Conference/seminar/workshop
1	Dr. Prabir Saha	7th Int. Conf. on Intelligent Systems, Modelling and Simulation (ISMS 2016), Bangkok, Thailand, (Jan-2016).
2	Mr. Abhishek Sarkhel	i. International Conference on Electromagnetics in Advanced Applications (ICEAA), Turin, Italy, September 2015. ii. IEEE Applied Electromagnetics Conference, Guwahati, India, December 2015.
3	Mr. Vinay Kumar	i. International Conference on Micro Electronics Electromagnetics and Telecommunications (ICMEET 2015), Visakhapatnam, India, December-2015. ii. BIT's 7th Annual International Congress of Cardiology -2015, Shanghai, China, December-2015.
4	Dr Ch V Rama Rao	International symposium on 5G, 28th March 2016 to 31 March 2016, IIT Patna

9. Laboratories set-up and up-gradation:

Sl. No.	Laboratory	Major Equipment & Software	Location
1.	Digital Signal Processing	DSP Processor. Make: Texas Instruments. Model: TMS320C6678	Computing Lab
2.	Digital Signal Processing	Code Composer Studio	Computing Lab
3.	VLSI Design	Cadence (Back-end)	Digital System Lab
4.	VLSI Design	FPGA(Virtex-6) EK-V6-ML605-G	Digital System Lab
5.	VLSI Design	FPGA Development Kit Xilinx XC 3S50	Digital System Lab
6.	VLSI Design	Modelsim (Front- End)	Digital System Lab
7.	RF and Microwave	ANSYS	Communication Lab
8.	MEMS Design	Intellisuite MEMS Design & Analysis Software	Communication Lab

Department of Electrical Engineering

1. Introduction

The Department of Electrical and Electronics Engineering has been part of the Institute since the inception. Presently the department offers B.Tech, M.Tech and PhD programs. The B. Tech program was started in 2010 with an intake of 30 students. In 2014 the M.Tech program was started with an intake of 20 students in the specialized area of Power and Energy Systems. There are 6 research scholars in the department registered for Ph.D.

The Department aims to impart quality education to the students and carry out fundamental and industry oriented research work. The research interest of faculties encompass various areas of electrical engineering such as deregulated power system, soft computing application in power system control, voltage stability assurance under deregulated environment, power electronics & drives, control system and instrumentation, embedded systems, renewable energy integration, high voltage engineering etc.

The department has well-equipped laboratories such as Electro-Technique Lab, Electrical Machine Lab, Network and Systems lab, Digital Electronics Lab, Power System Simulation Lab, Control & Instrumentation Lab, Power Electronics & Drives Lab, Microprocessor Lab, Microcontroller & Embedded Systems Lab. There are some specialized simulation software like Power Factory 14.1 (DigSILENT), PSIM (Power Simulator), PSS@E (Power System Simulator for Engineers), EMTP (Electro-Magnetic Transient Program) are available in the department to develop the computing efficiency of the students and also to carry out research activities.

2. Programmes offered:

- B. Tech in Electrical and Electronics Engineering (Full-time)
- M. Tech in Power and Energy Systems (Full-time)
- Ph D (Full-time and Part-time)

3. Faculty Profile:

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Dr. Gayadhar Panda	PhD (IEST, Kolkata)	Associate Professor	Power Electronics,	29.01.2013	1-Awarded 3- Ongoing
Dr. Asim Datta (Released on 29.02.2016 to join as Assoc. Prof. in Mizoram Univ.)	PhD (IEST, Kolkata)	Assistant Professor	Embedded System	16.07.2012	-
Dr. Biswajit Kar	PhD (IIT Kharagpur)	Assistant Professor	Instrumentation	31.10.2013	-
Dr. Atanu Banerjee	PhD (ISM Dhanbad)	Assistant Professor	Power Electronics & Drives	25.08.2014	3 ongoing
Dr. Supriyo Das	PhD (IIT Kanpur)	Assistant Professor	High Voltage Engg.	25.08.2014	1 ongoing
Dr. Sanjoy Debbarma	PhD	Assistant Professor	Power and Energy Systems	19.06.2012	-
Mr. Biswajit Halder	M.E., Pursuing PhD	Assistant Professor	Measurement & Control systems	23.07.2012	-
Mr. Rakesh Roy	M. Tech, Pursuing PhD	Assistant Professor	Power Electronics and drives	03.01.2013	-
Mr. Shaik Affijulla	M. Tech., Pursuing PhD	Assistant Professor	Power Systems	03.01.2013	-
Mr. Mousam Ghosh	M. E., Pursuing PhD	Assistant Professor	Power Electronics & Drives, Illumination Engineering	23.08.2013	-
Ms. Ramyani Chakrabarty	M. Tech (IIT Guwahati) Pursuing PhD	Trainee Teacher	Power and Control Engineering	21.07.2014	-

4. Research thrust areas:

- i. Smart grid Technology
- ii. Renewable energy integration
- iii. Industrial Drives & control
- iv. Lightning Transient

5. Sponsored Research Projects:

Sl. No.	Project Title	PI & Co-PI	Funding Agency	Funding Amount (Rs. in Lakhs)	Project Status	Duration
1	Design and development of DSP / FPGA based digital controller for hybrid active power filter applied to Industrial non-linear loads in distribution system.	Dr.G. Panda, Mr. S. Affijulla	DST, Govt. of India	22.98	Completed	3 Yrs
2	Development of FPGA based Digital Controller for 3-phase Voltage Source Inverter Fed PM Motor.	Dr. A. Banerjee	NIT-Meghalaya	2.50	Ongoing	2 yrs
3	Investigation of Transient Over-Voltage Phenomena in UG Power Cables due to Lightning Stroke.	Dr. S. Das	NIT-Meghalaya	2.08	Ongoing	2 yrs

6. Research facility:

- Software Licenses:Power System Simulator for Engineers (PSS@E), Digsilent Power Factory, PSIM, MATLAB, EMTP (Electro-Magnetic Transient Program)
- The Department has few hardware Proto type models such as Active Power Filter and FPGA based Induction motor drive for accelerating research activities in the specified area.
- The Department has also initiated to procure high standard measuring instruments like Power Analyser, LCR Meter and DSO that facilitate research work.

7. Publications:

a. Journals

- i. P. Garanayak and **G. Panda**, "Harmonic Elimination and Reactive Power Compensation by Novel Control Algorithm based Active Power Filter", *Journal of Power Electronics* Vol. 15, No. 6, November 2015.
- ii. Santanu Kumar Dash, **Gayadhar Panda**, Pravat Kumar Ray and Sashank Sekhar Pujari "Realisation of active power filter based on Indirect Current Control Algorithm using Xilinx System Generator for Harmonic Elimination", *International Journal of Electrical Power and Energy System-Elsevier Science*, 74 (2016), 420-428.
- iii. P.K.Ray, P.S.Puhan, and **G.Panda**, "Real time harmonics estimation of distorted power system signal" *International Journal of Electrical Power and Energy System-Elsevier Science*, 75 (2016), 91-98.
- iv. P. Garanayak and **G. Panda**, "A Fast and Accurate Measurement of Harmonic Parameters Employing Hybrid ADALINE-FXLMS algorithm", *IET Generation, Transmission & Distribution* Vol. 10 (2016), Iss. 2, pp. 421–436.
- v. Smitha Joyce Pinto and **Gayadhar Panda**, "Performance evaluation of WPT based islanding detection for grid-connected PV systems" *International Journal of Electrical Power and Energy System-Elsevier Science*, 78 (2016), 537-546.
- vi. **Sanjoy Deb Barma** and, Arunima Dutta, "Utilizing Electric Vehicles for LFC in Restructured Power Systems using Fractional Order Controller", *IEEE Transactions on Smart Grid*, 2016, DOI 10.1109/TSG.2016.2527821.
- vii. Agamani Chakraborty,Pradip K. Sadhu, and **Atanu Banerjee**, "Review of Induction Heating system – a comprehensive replacement of BSD 2000 in Hyperthermia Treatment Technology",*Journal of Biological ,Pharmaceutical And Chemical Research*, Vol 2, Issue 1, pp. 1-12, April,2015.
- viii. **R. Roy**, A. Dalal, P. Kumar, "Prediction of High Frequency Core Loss for Electrical Steel Using the Data Provided by Manufacturer", *Journal of magnetism and magnetic materials*, Vol.-410, Page No. 248-256, 2016.

b. Conferences

- i. S.J.V.Prakash and **Biswajit Kar**, "Iris Recognition for Person Verification", *IEEE 3rd International Conference on Electronics and Communication Systems ICECS 2016*, Coimbatore.
- ii. Asim Datta, Krishanu Bhattacharjee, **Sanjoy Debbarma**, **Biswajit Kar**, "Load Frequency Control of a Renewable Energy Sources based Hybrid System", in proceeding on 2015 IEEE Conference on Systems, Process and Control (ICSPEC 2015), 18 - 20 December 2014, Bandar Sunway, Malaysia
- iii. Pravat Kumar Ray, Sourav Bengani and **Gayadhar Panda**, " Estimation of Power System Frequency using a Modified Non-linear Least Square Technique", 2015 IEEE PES General Meeting July 26-30, 2015, Denver, USA.
- iv. B. Baruah, **M. Ghosh**, **S. Das**, "Optimal Placement of Protective Devices in a Distributed Power System", *IEEE INDICON 2015*, Period -17th-20th Dec, 2015, Place -Delhi, India.
- v. **M. Ghosh**, S. Ghosh, P.K. Saha, G.K. Panda, "Design and Implementation of PIC16F877A Microcontroller Based Data Acquisition System with Visual Basic Based GUI", *7th International Conference on Intelligent Systems, Modelling and Simulation 2016, IEEE Sponsored*, 25-27 Jan, 2016, Bangkok, Thailand.
- vi. **Sanjoy Debbarma**, L.C Saikia, Nidul Sinha, **Asim Datta** and **B.Kar**, "Fractional order two degree of freedom control for AGC of an interconnected multi-source power system", *17th IEEE Conference on Industrial Technology*, March 14-17, 2016 (ICIT 2016), Taipei..
- vii. **Sanjoy Debbarma**, Anubhav Nath, Upasana Sarma and Lalit Chandra Saikia, "Cuckoo search algorithm based two degree of freedom controller for multi-area thermal system", *IEEE ICEPE 2015*, NIT Meghalaya, Shillong.
- viii. **Atanu Banerjee**, P K Biswas, Chiranjit Sain, "The Comparative Study between Different Performance Indices of a Permanent Magnet Synchronous Motor (PMSM) Drive on Variable Sensor Angle"- published in the proceedings of the International Conference on Power Electronics Systems and Applications (PESA-2015), Sponsored by IEEE, IET, Hongkong Polytechnic University, Hongkong, 15-17 December 2015, pp.1-6.
- ix. P K Biswas, **Atanu Banerjee**, Chiranjit Sain, " Design and Development of a Closed Loop Model of an Adjustable Speed Permanent Magnet Synchronous Motor (PMSM) Drive using PI Controller"- published in the proceedings of the International Conference on Power Electronics Systems and Applications (PESA-2015), Sponsored by IEEE, IET, Hongkong Polytechnic University, Hongkong, 15-17 December 2015, pp.1-5.
- x. Chiranjit Sain, Pabitra Kr. Biswas, **Atanu Banerjee**, "Design and analysis of open loop model of a Permanent Magnet Synchronous Motor (PMSM) Drives", published in the proceedings of the International Conference on Energy, Power and Environment (Towards Sustainable Growth) [ICEPE-2015], June 12-13, 2015, Shillong.
- xi. Agamani Chakraborty, Koushik Neogi, **Atanu Banerjee** and Pradip K. Sadhu, "Switching frequency optimization in Hyperthermia treatment using BSD 2000"- published in the proceedings of the International Conference on Energy, Power and Environment (Towards Sustainable Growth) [ICEPE-2015], June 12-13, 2015, Shillong.
- xii. P. Satish Kumar and **Supriyo Das**, "Study of Lightning Phenomena on UG Cables based on Soil Resistivity", IEEE International Conference on Condition Assessment Techniques in Electrical Systems (CATCON), Bangalore, India, Dec 2015.
- xiii. Swarnankur Ghosh and **Supriyo Das**, "Effect of lightning on soil characteristics with and without underground cable", 2nd IEEE International Conference on Control, Instrumentation, Energy and Communication (CIEC), Kolkata, India, Jan 2016.
- xiv. **Shaik Affijulla**, Praveen Tripathy, "Estimation of phasor under dynamic condition using convolution", 2015 IEEE PES General Meeting, Colorado, USA, PP. 1-5, 2015.

8. Patents:

- i. Pradip K. Sadhu, Kaushik Neogi, **Atanu Banerjee**, **G. Panda**, Nitai Pal, K. C. Jana, "An Induction Curing System for Roof Treatment with Asphalt Concrete to Cure a Crack on Roof and a Method for the Same", Published in Journal of Intellectual Property India (Journal No-04/2016), Department of Industrial Policy & Promotions, Government of India, January, 2016, page no: 3575 & Patent Application No: 1221/KOL/2015, dated 30.11.2015, Grant is awaited.

9. (a) Faculty recharging:

Sl. No.	Name	Program	Duration	Location
1	Mr. R. Roy	National level training programme on Printed Circuit Board Design and Fabrication	14th – 19th Nov. 2015	NIT Meghalaya
2	Dr. A. Banerjee	Workshop on Accreditation and Transformation of Technical Education OBE	22nd to 23rd Jan 2016	NIT Meghalaya
3	Mr. S. Debbarma	Workshop on Accreditation and Transformation of Technical Education to OBE	22nd to 23rd Jan 2016	NIT Meghalaya
4	Mr. M. Ghosh	Training program on Printed Circuit Board (PCB) Design & Fabrication	27th – 28th Nov, 2015	NIT Meghalaya
5	Dr. B. Kar	Workshop on Design and Implementation of Instrumentation System using LabVIEW (DIISL-2015),	14th-19th Dec, 2015	NIT Rourkela
6	Dr. B. Kar	Work shop on accreditation and Transformation of Technical Education to OBE	22nd to 23rd Jan 2016	NIT Meghalaya

(b) Conferences Attended by Faculty

Sl. No.	Name of Faculty	Name of Conference	Location	Date
1	Dr. A. Banerjee	International Conference on Power Electronics Systems and Applications (PESA-2015)	Hong Kong Polytechnic University	15-17 Dec 2015
2	Dr. B. Kar	International Conference on Industrial Technology (ICIT 2016)	Taipei, Taiwan	14-17 Mar 2016
3	Dr. G. Panda	IEEE PES General Meeting	Denver, USA	26-30 Jul 2015
4	Mr. M. Ghosh	7th International Conference on Intelligent Systems, Modelling and Simulation 2016	Bangkok, Thailand	25-27 Jan 2016
5	Mr. S. Debbarma	17th IEEE Conference on Industrial Technology (ICIT 2016)	Taipei, Taiwan	14-17 Mar 2016
6	Mr. S. Affijulla	2015 IEEE PES General Meeting	Colorado, USA	26-30 Jul 2015

10. Awards / recognitions received at the national and international level by :

- i. Faculty member Mr. S. Debbarma bagged best paper award in International conference on Energy, Power and Environment conference (ICEPE 2016), IEEE Conference, held at NIT Meghalaya during 12th – 13th June 2015 for the paper ***“Cuckoo search algorithm based two degree of freedom controller for multi-area thermal system”***.
- ii. M. Tech student Mr. P. Satish Kumar was awarded the best technical paper in 2nd IEEE International Conference on Control, Instrumentation, Energy and Communication (CIEC), Kolkata, India, Jan 2016 for the paper ***“Effect of lightning on soil characteristics with and without underground cable”***.

11. Conferences/Workshops organized:

Name of the workshop/conference	Date	Sponsors
International Conference on Energy, Power and Environment (Towards Sustainable Growth), ICEPE 2015	12-13 June, 2015	SERB, DST NEEPCO, RITES
Training programme on Printed Circuit Board (PCB) Design & Fabrication at NIT Meghalaya, Shillong.	27 - 28 Nov, 2015	In association with Maverick Technologies

12. Special lectures:

Event	Topics	Experts	Date
Invited talk	Transmission Systems in India: Present Trends	Prof. Samajit Sengupta, University of Calcutta	17th April 2015

13. Laboratories:

- i. Basic Electrical Lab.
- ii. Digital Electronics Lab.
- iii. Electrical Machines Lab.
- iv. Measurement & Instrumentation Lab.
- v. Control system Lab.
- vi. Microprocessor, Microcontroller, DSP & Embedded System Lab.
- vii. Power System, Switchgear & Protection Lab.
- viii. Power Electronics Lab.
- ix. Electric Drives Lab.
- x. Network Analysis Lab.
- xi. Computational Lab.

14. Any other notable information:

- i. Organized a field trip at Kopili Hydro Electric Power Plant, NEEPCO, for 8th semester, EE, B. Tech students on April 25, 2015.
- ii. Organized a field trip at Umiam-Umtru Stage II Power Station (MeECL), Um Sumer for 6th semester, EE students, in April 2015

Department of Mechanical Engineering

1. Introduction:

The department of Mechanical Engineering was started in the year 2012 with the offering of basic engineering science courses. The department started the 4-years (8 semesters) B. Tech. Programme in Mechanical Engineering in 2013 with an intake capacity of 30. In the year 2014, the department started the PhD programme in the area of Design & Manufacturing, Application of Soft Computing Techniques in Machining, Computational Fluid Dynamics, Turbulence Modelling, Fluid Mechanics, etc. The department also started the M. Tech programme from the session 2015-16 in the stream of Fluids & Thermal Engineering. Beside these, the department offers common courses for the students of 1st year B. Tech. in Engineering Mechanics, Basic Thermodynamics and Workshop Practice.

At present, the department has a Workshop and 10(ten) laboratories. The main objective of the department is to produce quality manpower in the fields of Mechanical Engineering by imparting appropriate theoretical knowledge as well as hands-on training in state-of-the-art laboratories & workshop. Basic aim of the department is to equip the students with the knowledge of the basic principles and experiences of the practices in mechanical engineering, which helps them to serve the society and address a variety of needs. The department also proposes to offer interdisciplinary courses keeping in view the requirements of today's world in the fields of robotics, mechatronics, nanotechnology, MEMS etc. The department gives equal importance to Research, consultancy and extension activities too.

Vision:

"To be a Centre of Excellence in education and research in the field of Mechanical Engineering and allied areas making its presence felt globally through the manpower produced and the knowledge and technologies created."

Mission:

1. To impart quality education in the fields of mechanical engineering at UG and PG levels.
2. To carry out research towards development of cutting edge technologies for the benefit of the society at large.
3. To participate in extension activities towards societal and rural development.

2. Names of programmes offered:

- B. Tech (Full-time) in Mechanical Engineering
- M. Tech (Full-time) in Fluids and Thermal Engineering
- Ph. D (Full-time & Part-time)

3. Faculty profile:

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Dr. Deba Kumar Sarma	PhD (IIT Guwahati)	Assistant Professor & HOD	Mechanical Design and Manufacturing	23.08.2013	Ongoing-2
Dr. Subhendu Maity	PhD (IIT Kharagpur)	Assistant Professor	Turbulence Modeling, Numerical Modeling, CFD	16.07.2012	Ongoing-1
Dr. Bikash Kumar Sarkar	PhD (Jadavpur Univ.)	Assistant Professor	Hydraulic System Design and Control, Data Acquisition System	21.08.2013	None
Dr. Biplab Kumar Debnath	PhD (IIT Guwahati)	Assistant Professor	Thermal Engineering, IC Engines, Alternative Fuels,	30.07.2014	Ongoing-1
Dr. Koushik Das	PhD (IIT Guwahati)	Assistant Professor	Bioheat transfer, Thermal behavior of biological tissues under collimated thermal radiation	30.07.2014	None

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Dr. Rajat Subhra Das	PhD (IIT Delhi)	Assistant Professor	Solar thermal cooling, Refrigeration & Air Conditioning Systems, Renewable Energy	16.07.2015	None
Dr. Kishore Debnath	PhD (IIT Rourkee)	Assistant Professor	Manufacturing, Composite materials, Machining	16.07.2015	None
Dr. Pallekonda Ramesh Babu	PhD (IIT Guwahati)	Assistant Professor	Solid mechanics fem force measurement, stress waves in solid soft computing	27.07.2015	None
Mr. S. Arun	M. Tech (IIT Guwahati)	Assistant Professor	Machine Design	27.07.2015	None
Mr Avilash Sahoo	M Tech (IIT Guwahati) Pursuing PhD	Trainee Teacher	Machine Design	19.07.2014	-
Md. Nur Alom	M Tech (IIT Guwahati) Pursuing PhD	Trainee Teacher	Fluid & Thermal Engineering	17.07.2014	-
Mr. Sambit Majumdar	Pursuing M Tech at IIT Guwahati	Trainee Teacher	Fluid and Thermal Engineering	20.07.2015	-

4. Visiting Fellows:

- Prof. P. K. Mahanta, Department of Mechanical Engineering, IIT Guwahati was involved in taking the Advanced Thermodynamics course for the M. Tech. students of the department in Autumn 2015. Eighty percent of the classes for the course were conducted using Virtual Class Room over NKN.
- Prof. S.K. Dwibedy, Department of Mechanical Engineering, IIT Guwahati delivered a popular talk on “Application of Mat-lab in strength of materials and Kinematics of Machines” at the Department of Mechanical engineering, NITM on 11-03-2016.
- Prof. P.M.Dixit, Department of Mechanical Engineering, IIT Kanpur delivered a popular talk on “Application of FEM for Engineers” at the Department of Mechanical engineering, NITM on 23-03-2016.

5. Research thrust areas:

- Manufacturing and Design
- Turbulence Modelling
- Computational Fluid Dynamics
- Hydraulic System Design and Control
- Robotics
- Fuel and Combustion, Alternate Fuels
- Thermal analysis of Biological Systems
- Composite Materials
- Solar Thermal Systems
- Vibration

6. Research facility / centre with:

a. Workshop:

- Fitting Shop
- Carpentry Shop
- Tool Room Shop
- Welding Shop

b. Laboratories:

- Strength of Materials Laboratory

- ii. Theory of Machines Laboratory
- iii. Fluid Mechanics Laboratory
- iv. Thermal Science Laboratory
- v. Materials Science Laboratory
- vi. Computational Laboratory
- vii. Hydraulic Circuit and Control Laboratory
- viii. CAD/CAM Laboratory
- ix. Advanced Manufacturing Laboratory
- x. Metrology and Instrumentation Laboratory

c. Software Licenses:

- i. CREO University Plus Lab Pack: (50 licenses) 3.0
- ii. ANSYS Academic Teaching Advanced Version Plus Academic Research Version 15.0 (25+5 licenses)
- iii. CONVERGE CFD
- iv. Automation Studio 6.1
- v. MasterCAM X9

7. Publications:

a. Journals:

- i. C. Marthong, **D. K. Sarma**, Influence of PET fiber geometry on the mechanical properties of concrete: an experimental investigation, *European Journal of Environment and Civil Engineering*, Taylor and Francis, Vol.-20, Issue No.-7, Page No. 771-784, 2016.
- ii. C. Marthong, **D. K. Sarma**, Flexural behavior of ferrocement plates incorporating steel and PET fibers, *Materials and Construction Technologies for Sustainable Development, Key Engineering Materials, Trans Tech Publication*, Vol.-666, Page No. 97-106, 2016.
- iii. R. Kalidasan, M. Yatin, **D. K. Sarma**, U.S. Dixit, S. Senthilvelan, Preliminary Experimental Investigation on Multi-Tool Turning Process, *International Journal of Machining and Machinability of Materials, Inderscience*, Vol.-Accepted, 2016.
- iv. K. Sasmal, **S. Maity**, H. Warrior, Modeling of turbulent dissipation and its validation in periodically stratified region in the Liverpool Bay and in the North Sea, *Ocean Dynamics*, Vol.-65, Issue No.-7, PageNos -969-988, 2015.
- v. K. Sasmal, SR Bonthu, **S. Maity**, H. Warrior, Effect of Atmospheric Forcing on Plume Dispersion and Study of Nuclear Effluent Trajectories for the Kalpakkam Coast, India, *Journal of Hazardous, Toxic and Radioactive Waste*, ASCE, Vol.-19, Issue No.-3, Page Nos -04014035-1 to 16, 2015.
- vi. P. Mandal, **B. K. Sarkar**, R. Saha, S. Mookherjee, D. Sanyal, Designing an optimized model-free controller for improved motion tracking by rugged electrohydraulic system, *ProclMechE Part I: J Systems and Control Engineering*, Vol.-230, Issue No.-5, Page Nos -385-396, 2016.
- vii. S. Dasmahapatra, **B. K. Sarkar**, R. Saha, A. Chatterjee, S. Mookherjee, D. Sanyal, Design of an Adaptive-Fuzzy-Bias-SMC and Validation for a Rugged Electrohydraulic System, *IEEE/ASME Transaction on Mechatronics*, Vol.-20, Issue No.-6, Page Nos -2708-2715, 2015.
- viii. P. Mandal, **B. K. Sarkar**, R. Saha, A. Chatterjee, S. Mookherjee, D. Sanyal, Real-time fuzzy-feedforward controller design by bacterial foraging optimization for an electrohydraulic system, *Engineering Applications of Artificial Intelligence*, Vol.-45, Page Nos -168-179, 2015.
- ix. B. B. Ghosh, **B. K. Sarkar**, R. Saha, Realtime performance analysis of different combinations of fuzzy-PID and bias controllers for a two degree of freedom electrohydraulic parallel manipulator, *Robotics and Computer-integrated manufacturing*, Vol.-34, Page Nos -62-69, 2015
- x. P. Mandal, **B. K. Sarkar**, R. Saha, S. Mookherjee, S. K. Acharya, D. Sanyal, GA-Optimized Fuzzy-Feedforward Motion Tracking Control by a Rugged Electrohydraulic System, *IEEE/ASME Transaction on Mechatronics*, Vol.-20, Issue No.-4, Page Nos -1734-1742, 2015.
- xi. F. Millo, **B. K. Debnath**, T. Vlachos, C. Ciaravino, L. Postrioti, and G. Buitoni, Effects of different biofuels blends on performance and emissions of an automotive diesel engine, *Fuel*, Vol.-159, Page Nos -614-627, 2015.

- xii. **B. K. Debnath**, U.K. Saha, and N. Sahoo, A comprehensive review on the application of emulsions an alternative fuel for diesel engines, *Renewable and Sustainable Energy Reviews*, Vol.-42, Page Nos -196–211, 2015.
- xiii. R. Singh, **K. Das**, S. C. Mishra, J. Okajima, S. Maruyama, Minimizing skin thermal damage using surface cooling during laser induced thermal therapy – a numerical study, *ASME: Journal of Thermal Science and Engineering Applications*, Vol.-8, Page Nos -011002-1-6, 2015.
- xiv. R. Singh, **K. Das**, J. Okajima, S. Maruyama, S.C. Mishra, Modelling skin cooling using optical windows and cryogens during laser induced hyperthermia in a multilayer vascularized tissue, *Applied Thermal engineering*, Vol.-89, Page Nos -28-35, 2015.
- xv. **K. Debnath**, A. Sisodia, A. Kumar, and I. Singh, Damage-Free Hole Making in Fiber-Reinforced Composites: An Innovative Tool Design Approach, *Materials and Manufacturing Processes*, Vol.-31, Issue No.-10, Page No. 1400-1408, 2016.
- xvi. A. V. Singhal, **K. Debnath**, I. Singh, and B.S.S. Daniel, Critical Parameters Affecting Mechanical Behavior of Natural Fiber Reinforced Plastics, *Journal of Natural Fibers*, 2016.
- xvii. **K. Debnath**, I. Singh, and A. Dvivedi, On the Analysis of Force During Secondary Processing of Natural Fiber Reinforced Composite Laminates, *Polymer Composites*, 2016.
- xviii. P. K. Bajpai, **K. Debnath**, and I. Singh, Hole Making in Natural Fiber-Reinforced Polylactic Acid Laminates: An Experimental Investigation, *Journal of Thermoplastic Composite Materials*, 2016.
- xix. V. Dhawan, **K. Debnath**, I. Singh, and S. Singh, Prediction of Forces during Drilling of Composite Laminates Using Artificial Neural Network: A New Approach, *FME-Transactions*, Vol. 44, Issue No.-1, Page No. 36-42, 2016.
- xx. V. Dhawan, **K. Debnath**, I. Singh, and S. Singh, A Novel Intelligent Software-based Approach to Predict Forces and Delamination during Drilling of Fiber-Reinforced Plastics, *Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications*, Vol.-230, Issue No.-2, Page No. 603-614, 2016.
- xxi. V. K. Doomra, **K. Debnath**, and I. Singh, Drilling of Metal Matrix Composites: Experimental and Finite Element Analysis, *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, Vol.-229, Issue No.-5, Page No. 886-890, 2015.
- xxii. **K. Debnath**, I. Singh, and A. Dvivedi, Rotary Mode Ultrasonic Drilling of Glass Fiber-Reinforced Epoxy Laminates, *Journal of Composite Materials*, Vol.-49, Issue No.-8, Page No. 949-963, 2015.

8. Sponsored Research Projects:

Sl. No.	Project Title	Funding Agency	Funding Amount (Rs.)	Project Status	Duration
1	Feasibility Studies for Generating Electric Power Using Helical Water Turbine. (Co-PI: Dr. D. K. Sarma)	Assam Power Generation Co. Ltd. (APGCL)	27.22 lakhs	Ongoing (with IITGuwahati)	2013-16
2	Technology Transfer of Betel Nut cutter and Briquette making m/c (PI: Dr. D. K. Sarma)	Rural Technology Action Group (RuTAG-NE)	1.8 lakhs	Completed	2015-16
3	NITMeghalaya as Tier-II Institution of RuTAG-NE (PI: Dr. D. K. Sarma)	RuTAG-NE, IITGuwahati	Yearly budget	Ongoing	2015 onwards
4	Modeling and Control of the Hydraulically Actuated Ring Inlet Guide Vane of Francis Turbine by Adaptive Neural Network Sliding mode Controller Design (PI: Dr. B. K. Sarkar)	DST	Project Approved		2016-19

9. Inter-institutional collaborative projects and associated grants received:

1. Collaborative sponsored project with IIT Guwahati: Feasibility Studies for Generating Electric Power Using Helical Water Turbine (Co-PI: Dr. D.K.Sarma)
2. NIT Meghalaya as Tier-II Institution of RuTAG-NE (Coordinator: Dr. D.K.Sarma)

10. Consultancy Works:

- a. Concrete Mix Design for construction of NIT Meghalaya, permanent campus at Sohra (Rs. 1,00,000/-)
- b. Third party quality Control/Assurance in various project of CPWD, Shillong (Rs. 2,26,452/-)
- c. Third party quality Control/Assurance in various project of CPWD, Shillong (1% of project cost)
- d. Testing of angle section and barbed wire for providing overhanging wire fencing at Shillong Airport under Airport Authority India Limited (Rs. 25,000/-)

11. Faculty selected nationally / internationally to visit other laboratories / institutions

a. Industries in India and abroad:

- i. Dr. B.K. Debnath is invited as a Guest Speaker at the 3rd International Conference on Energy and Sustainability (ICES2015), during April 17-19th, 2015, Beijing, China.

12. Faculty recharging:

Sl. No.	Name of Faculty	Name of Program (2015-2016)	Duration
1.	Dr. D. K. Sarma	17th International Conference on Mechanics, Materials and Civil Engineering (ICMMCE 2015) organized by World Academy of Science Engineering & Technology (WASET), Paris, France	July 20-21, 2015
		18th International Conference on Mechanical, Materials and Manufacturing Engineering (ICMMME 2016) organized by World Academy of Science Engineering & Technology (WASET), London, UK.	Jan 18-19, 2016
2.	Dr. S. Maity	Advances in Applications of Computational Fluid Dynamics, organized by Department of Applied Mechanics, MNNIT Allahabad	Aug 12-16, 2015
		Second International Conference on Applied Mechanics, Thailand, Phuket	Dec 27-28, 2015
		Accreditation and Transformation of Technical Education, NIT Meghalaya	Jan 22-23, 2016
3.	Dr. B. K. Sarkar	Second International Conference on Applied Mechanics, Thailand, Phuket	Dec 27-28, 2015
		Accreditation and Transformation of Technical Education, NIT Meghalaya	Jan 22-23, 2016
4.	Dr. B. K. Debnath	3rd International Conference on Energy and Sustainability (ICES 2015), Beijing, China	Apr 17-19, 2015
5.	Dr. K. Das	23rd National Heat and Mass Transfer Conference and 1st International ISHMT-ASTFE Heat and Mass Transfer Conference, ISRO, Thiruvananthapuram	Dec 17-20, 2015
		Fundamentals of Microfluidics and its Applications in Bio-Medical Engineering, IIT Guwahati	Jan 22-23, 2016
6.	Dr. K. Debnath	Twenty-Fourth International Symposium on Processing and Fabrication of Advanced Materials (PFAM - XXIV), Kansai University, Osaka, Japan	Dec 18-20, 2015
		KIC-TEQIP Sponsored Short Term Course on "Advanced Gear Engineering", Department of Mechanical Engineering, IIT Guwahati	Nov 21-22, 2015
		Two days Conclave of Head of Mechanical Engineering on "Mechanical Engineering Conclave: Boosting for Academic, Research, Innovation and Socio-economic Development in the Region of All NITs of India", Department of Mechanical Engineering, NIT Agartala.	Oct 09-10, 2015

13. Awards / recognitions received at the national and international level by

a. Faculty:

Dr. D. K. Sarma was awarded the Best Teacher Award at the 1st Institute day celebrations of NIT Meghalaya

b. Students:

1. Mr. Jai, a student of 6th Semester got 1st prize in All India e-Yantra Robotics Championship, 2016 held at IIT Bombay during March 2016.
2. Aiboklang Sawkmie, a student of 6th Semester got the Best Student Award in Cultural Activities for the year 2015-2016
3. Nikhil Tripathi, a student of 6th Semester got the Best Student Award in Community Service Activities for the year 2015-2016
4. Mangesh Sharma, a student of 6th Semester got the Best Student Award in Technical Activities for the year 2015-2016

14. Seminars/ Conferences/Workshops organized

Sl. No.	Name of Sem./Conf./ Workshop	Funding Agency
1	Computational Modeling and Analysis using Ansys and Creo (CoMAAC) held during June 3-7, 2015.	NIT Meghalaya, PTC Creo Allied DesignSoft Solutions Pvt. Ltd and Innovent Engineering Solutions Pvt. Ltd
2	Identification of challenging, need-based problems related to science & technology concerning rural economy held on 18th March, 2016	RUTAG-NE

15. Future plans of the department.

- To set new state-of-the-art laboratories for bachelors, post graduates and for researchers
- To increase the number of interdisciplinary courses
- To organize invited talks, national & international workshops, seminars and conferences

Department of Civil Engineering

1. Introduction:

The department of Civil Engineering was started in the year 2013. The department consists of combination of bright, young as well as highly experienced senior faculty members. The main objective of the department is to cater the students with class tutorial and in hand practice with the state-of-the-art laboratories. The basic aim of the department is to provide the students with perfect principles and practices in Civil Engineering, which helps them to serve the society and address a variety of needs.

2. Programme Offered:

- B. Tech Programme in Civil Engineering (Full-time)
- M. Tech Programme in Water Resources Engineering (Full-time)
- Ph.D. Programme (Full-time & Part-time) with the specialization of Structural Engineering, Environmental Engineering and Water Recourse Engineering etc.)

3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Remarks
Dr. Comingstarful Marthong	Assistant Professor	Ph.D. (IIT Guwahati)	Structural Engineering	10.01.2013	Head of the Department and Faculty-in-charge, Structural and Geotechnical Engg. lab
Prof. P. S Choudhury (Reverted back to NIT Silchar on 15.12.2015)	Professor	PhD (RGPV-Bhopal)	Water Resource Engineering	02.01.2015	-
Dr. Meena Khwairakpam	Assistant Professor	Ph.D. (IIT Roorkee)	Environmental Engineering	13.12.2013	Faculty-in-charge, Environmental Lab
Dr. M. L. Patton	Assistant Professor	Ph.D. (IIT Guwahati)	Structural Engineering	05.08.2013	Faculty-in-charge, Computational Lab and Transportation Engg. Lab
Dr. Hriday Mani Kalita	Assistant Professor	Ph.D. (IIT Guwahati)	Water Resource Engineering	12.08.2014	Faculty-in-charge, Fluid Mechanics Lab and Drawing Hall
Mr. Suman Kumar	Trainee Teacher	M. Tech (Pursuing at IIT Guwahati)	Structural Engineering	16.07.2014	--
Ms. Rubi Chakraborty	Trainee Teacher	M. Tech (Pursuing at IIT Guwahati)	Geotechnical Engineering	21.07.2014	--
Mr. Supratim Kaushik	Trainee Teacher	Pursuing M.Tech	Transportation Engineering	20.07.2015	--

4. List of Publications:

a. Journals

- Kalita, H. M.,** Sarma, A. K., and Bhattacharjya, R. K. (2014), "Evaluation of Optimal River Training Work Using GA Based Linked Simulation Optimization Approach", Water Resources Management, Springer. Volume 28, Number 8, pp 2077-2092.
- Patton, M.L.** & Singh, K.D., 2014. "Finite element modelling of concrete-filled lean duplex stainless steel tubular stub columns". International Journal of Steel Structures, Springer; 14: 619-632.
- Marthong C.** and Marthong S. (2015). Enhancing mechanical properties of concrete prepared with coarse recycled aggregates. The IES Journal Part A: Civil & Structural Engineering, Vol. 8 (3), pp. 175 - 183.

- iv. **Marthong, C.,** Dutta, A. and Deb, S.K. (2015). "Study on size effect of RC and Rehabilitated exterior beam-column connections under cyclic loading" European Journal of Environmental and Civil Engineering, DOI: 10.1080/19648189.2015.1056385.
- v. **Marthong C.** (2015). Effects of PET fiber arrangement and dimensions on mechanical properties of concrete. The IES Journal Part A: Civil & Structural Engineering, Vol. 8 (2), pp. 111 – 120.
- vi. Sonowal, P., **Khwairkpam, M.,** Kalamdhad, A. S., (2015). Vermicomposting of Dewatered Sludge from Pulp and Paper mill. Int. J. of Environment and Waste Management, 15(1), 24-38

b. Conferences:

- i. **Kalita, H. M.** (2015), "A comparative study of two different downstream boundary conditions in modelling river flow", CD proceedings of International Conference on Sustainable Technologies in Building & Environment, Chennai on 15-17 July 2015.

5. Invited Talks Delivered:

Dr. Meena Khwairkpam invited as an:

- i. Expert lecture on "Solid Waste Management- Challenges and Opportunities", 12-14 January 2015 at Department of Civil Engineering, Indian Institute of Technology Guwahati, India.
- ii. Invited speaker for the Symposium on "Management and Procurement of Integrated Waste Management System", 6-7 February 2015 at Department of Civil Engineering, Indian Institute of Technology Guwahati, India.

6. Projects:

a. Sponsored Projects:

Sl. No.	PI	Title of the Project	Sponsoring Agency	Funding Amount	Period	Status
1	Dr.C. Marthong	Rehabilitation of RC beam-column connections by epoxy resin injection and FRP sheets wrapping.	SERB-DST	Rs. 20.88 lakhs	2014-17	Ongoing
2	Dr. Meena Khwairkpam	Biodegradation of pulp and paper mill waste using different composting techniques	SERB-DST, GOI, New Delhi	Rs. 32.93 Lakhs	2014-17	Ongoing
3	Dr. C. Marthong	Seismic Vulnerability Assessment of School Buildings of East Khasi Hills District of Meghalaya and Method of Reducing it	State Disaster Management Authority (SDMA), Govt. of Meghalaya	Rs. 9.12 lakhs	2015-17	Ongoing

b. Consultancy:

Sl. No.	Consultant	Title of the Project	Sponsoring Agency	Value of the Project	Status
1	Dr. C. Marthong	Concrete Mix Design for construction of NIT Meghalaya, permanent campus at Sohra (First phase)	RITES, Gurgoan	Rs 1,11,000.00	Completed
2	Dr. C. Marthong	Concrete Mix Design for construction of NIT Meghalaya, permanent campus at Sohra (Second phase)	RITES, Gurgoan	Rs 1,00,000.00	Completed
3	Dr. C. Marthong	Third party quality Control/Assurance in various project of CPWD, Shillong	CPWD	Total Income: 1% of the total inspected cost	Ongoing

7. Conferences / Workshop / Training Attended:

- Dr. C. Marthong attended workshop on “Seismic Requalification of Pile Supported Structures” organized by UKIERI, UK-India Education and Research Initiatives at IIT Guwahati on 7th - 9th Jan 2015.
- Dr. H. M. Kalita attended international conference on “Sustainable Technologies in Building & Environment” organized by Sathyabama University in Chennai on 15-17th July 2015.

8. Laboratories Setup:

Sl. No.	Laboratory	Major Equipment & Software	Cost
1.	Structural Engineering	NDT Equipment (UPV and Rebound Hammer), Compression testing machine, corrosion meter, cement Auto Clave, Tensile testing Machine, Abrasion testing machine	21.35 lakhs
2.	Computational	Abaqus, MIKE21C	34.43 lakhs
3.	Geotechnical Engineering	Automatic free fall hammer, CBR motorized apparatus, Relative density	3.2 lakhs
4.	Environmental Engineering	Visible spectro photo meter, BOD incubator, COD reactor, Flame photo meter, Visible spectro photo meter	10.77 lakhs
5	Surveying	Total station, Theodolite	5.9 lakhs

9. Any Other Notable Information:

- Dr. Meena Khwairakpam, Reviewer of the various Journals-Ecological Engineering, International Journal of recycling of organic waste, Water Science and Technology, Environmental Engineering Research

Department of Mathematics

1. Introduction

The Department of Mathematics was established in 2012. The Department offers PhD and 2 years M.Sc. programme. During the year under review, the Department started two years M.Sc. programme. In addition to its own programmes the department offers various courses for the B. Tech and M. Tech programmes of the institute. The strength of the faculty in the department was enhanced to seven with the joining of three new members during the year.

2. Faculty Profile:

Name	Institution awarding PhD	Designation	Specialization	Date of joining
Dr. Tikaram Subedi	NEHU, Shillong	Asst. Professor & HoD	Abstract Algebra	01-06-2012
Dr. Manideepa Saha	IIT Guwahati	Asst. Professor	Linear Algebra	22-07-2013
Dr. Saikat Mukherjee	University of Wyoming, USA	Asst. Professor	Functional Analysis	25-07-2013
Dr. Bapan Ghosh	IEST, Shibpur	Asst. Professor	Mathematical Biology	28-01-2015
Dr. Bidyasagar Kumbhakar	ISM, Dhanbad	Asst. Professor	Fluid Dynamics	20-07-2015
Dr. Srinivas Jangili	NIT Warangal	Asst. Professor	Fluid Dynamics	27-07-2015
Dr. Nabakumar Jana	IIT Kharagpur	Asst. Professor	Statistics	27-08-2015

3. Research Projects:

Sl. No	Title of the Project	Principal Investigator	Sponsoring Organization and Amount	Duration
1	Pulses in Spatial Population Dynamics	B. Ghosh (India) L. Mailleret (France)	Indo-French Centre for Applied Mathematics & University Nice Sophia Antipolis, France. Euro 9440/-	1 year
2	On splitting of generalized M. Matrices	Dr. Manideepa Saha	NIT Meghalaya, Rs 25000/-	2 years

4. Publications:

a. Journals:

- M. Saha** and S. Bandopadhyay, Combinatorial properties of generalized M-matrices, *Electron. Journal of Linear Algebra*, Vol. 30, pp. 550-576, 2015.
- B. Ghosh**, L. Mailleret and F. Grogard, Natural enemies deployment in patchy environments for augmentative biological control. *Applied Mathematics and Computation*, Vol. 266, pp. 982-999, 2015.
- P. Paul, **B. Ghosh** and T. K. Kar, Impact of species enrichment and fishing mortality in three species food chain models. *Communications in Nonlinear Science and Numerical Simulation*, Vol. 29(1-3), pp. 208-223, 2015.
- G. S. Seth, R. Sharma, **B. Kumbhakar** and A. J. Chamkha, Hydromagnetic Flow of Heat Absorbing and Radiating Fluid over Exponentially Stretching Sheet with Partial Slip and Viscous and Joule Dissipation, *Engineering Computations*, Vol. 33(3), pp. 907-925, 2016.
- N. Jana**, S. Kumar and N. Misra, Classification rules for two-parameter exponential populations under order restrictions on parameters, *Journal of Statistical Computation and Simulation*, Vol. 86(8), pp.1559-1581, 2016.
- N. Jana** and S. Kumar, Classification into two-parameter exponential populations with a common guarantee time, *American Journal of Mathematical and Management Sciences*, Vol. 35(1), pp. 36-54, 2016.
- N. Jana** and S. Kumar, Estimation of ordered scale parameters of two exponential distributions with a common guarantee time, *Mathematical Methods of Statistics*, Vol. 24(2), pp. 122-134, 2015.
- J. Srinivas** and J. V. Ramana Murthy, Second Law Analysis for the Flow of Two Immiscible Micropolar Fluids between Two Porous Beds, *Journal of Engineering Thermophysics*, Vol. 25(1), pp. 126-142, 2016.
- M. Saha**, Iterative method for linear System with coefficient matrix as an Mv matrix, *Applied and Computational Matrix Analysis* in the series Proceeding of Mathematics and Statistics (Accepted).

- x. **Tikaram Subedi** and A.M. Buhphang, On SF rings and Strongly regular rings, *Kyungpook Mathematical Journal* (Accepted).
- xi. **J. Srinivas**, J. V. Ramana Murthy and A. J. Chamkha, Analysis of Entropy Generation in an Inclined Channel Flow Containing Two Immiscible Micropolar Fluids Using HAM, *International Journal of Numerical Methods for Heat and Fluid Flow*, DOI: 10.1108/HFF-09-2015-0354. (Accepted).
- xii. G. Nagaraju, **J. Srinivas** and J. V. Ramana Murthy, A.M. Rashad, Entropy Generation Analysis of the MHD Flow of Couple Stress Fluid between Two Concentric Rotating Cylinders with Porous Lining, *Heat Transfer-Asian Research*, DOI: 10.1002/htj.21214. (Accepted).
- xiii. **J. Srinivas** and J. V. Ramana Murthy, Thermal Analysis of Flow of Immiscible Couple Stress Fluids in a Channel, *Journal of Applied Mechanics and Technical Physics*. (Accepted).

b. Conferences:

- i. S. Basu, **N. Jana**, A. Bag, M. Mahadevappa, J. Mukherjee, S. Kumar and R. Guha, Emotion recognition based on physiological signals using valence-arousal model, *3rd International Conference on Image Information Processing (ICIIP) IEEE Conference Publications*, pp.50-55, DOI:10.1109/ICIIP.2015.7414739, 2016.
- ii. **Dr. Manideepa Saha**, Iterative method for linear system with coefficient matrix as an M V -matrix, *International conference MAT-TRIAD*, University of Coimbra, Portugal during September 7-11, 2015.
- iii. **Dr. Bapan Ghosh**, *International Conference on Recent Advances in Mathematical Biology, Analysis and Applications (ICMBAA2015)*, Aligarh Muslim University, 04-06 June, 2015.
- iv. **Dr. Srinivas Jangili**, Thermodynamic Analysis for an Inclined Channel containing Two Immiscible Micropolar Fluids using HAM, *60th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM)*, MNIT Jaipur, Rajasthan, India during December 16-19, 2015.
- v. **Dr. Srinivas Jangili**, Effect of Buoyancy Force on Entropy Generation in a Vertical Parallel Plate Channel, *XXVII IUPAP Conference on Computational Physics: CCP2015*, IIT Guwahati, December 02-05, 2015.
- vi. **Dr. Bidyasagar Kumbhakar**, Effects of Hall Current, Rotation and Thermo-Diffusion on Unsteady MHD Free Convection Heat and Mass Transfer Flow Past a Moving Vertical Plate Embedded in a Uniform Porous Medium, *60th Congress of Indian Society of Theoretical and Applied Mechanics (ISTAM)-An International Conference*, MNIT Jaipur, December 16- 19, 2015.
- vii. **Dr. Bidyasagar Kumbhakar**, Unsteady MHD Free Convection Flow with Hall Effects of a Radiating and Heat Absorbing Fluid Past a Moving Vertical Plate with Variable Ramped Temperature, *XXVII IUPAP Conference on Computational Physics (CCP-2015)*, IIT Guwahati, December 02- 05, 2015.

5. Conference and Workshops Attended:

Name	Program	Organized by	Duration
Dr. Tikaram Subedi	Workshop on Mathematical Analysis and its applications to engineering	IIT Guwahati	January 02-04, 2015
Dr. Tikaram Subedi	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Saikat Mukherjee	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Manideepa Saha	Workshop on Mathematical Analysis and its applications to engineering	IIT Guwahati	January 02-04, 2016
Dr. Manideepa Saha	Workshop on Indian Woman and mathematics: regional workshop on research and opportunity	IIT Guwahati	February 16-19, 2016

Name	Program	Organized by	Duration
Dr. Manideepa Saha	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Bapan Ghosh	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Srinivas Jangili	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Bidasagar Kumbhakar	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016
Dr. Nabakumar Jana	Two Day workshop on accreditation and transformation of Technical education	NIT Meghalaya	January 22-23, 2016

6. Invited Talks Delivered:

Dr. Bapan Ghosh delivered invited lecture in a National workshop on “Indian Workshop and Symposium on Modelling Experimentation and Simulation on Complex Systems” (MESCoS 2015) organized by Haldia Institute of Technology, Haldia, West Bengal during August 05-07, 2015.

7. Any Other Notable Activities:

- a) Summer Internship Programme is arranged in every summer with an objective of encouraging bright students of different Institutes in India to pursue innovative researches and development projects under the guidance of faculty members from NIT Meghalaya. Mathematics faculty members actively participate in the programme. In summer 2015, the following students did summer internship from Mathematics Department, NIT Meghalaya:
 - (i) Ms. Athulya Ram S from IISER TVM under Dr. Bapan Ghosh on “Yield in Spatially Structured Environment”
 - (ii) Ms. Parishmita Kakati from Tezpur University under Dr. Saikat Mukherjee on “A Survey on Frame Theory in Hilbert Spaces”
- b) Dr. Bapan Ghosh, Assistant Professor, Department of Mathematics was appointed as a PhD co-supervisor for a scholar in IEST Shibpur.

Department of Physics

1. Introduction:

The Department of Physics, NIT Meghalaya was established in 2010. The department has actively imparted education to the students of B. Tech 1st and 2nd years in theoretical aspects of various areas along with related experiments to provide greater understanding of the subjects that would help to become better engineers. The PhD programme in the Department is successfully running in the domain of Material Science with special emphasis on Liquid Crystals, Metal Oxide semiconductors, Semiconductors nanostructure and devices and sensors. M. Sc. programme of the Department is effectively running with special emphasis on the applied aspects of Physics from July 2015.

2. Programme Offered:

- a. M. Sc (Full-time)
- b. Ph. D (Full-time and Part-time)

3. Faculty Profile:

Name	Qualification	Designation	Specialization	Date of Joining	PhD Guidance
Dr. Ayon Bhattacharjee	PhD (NEHU)	Associate Professor	Material Science	24.07.2013	4 - Awarded 4 - Pursuing
Dr. Arpita Nath	PhD (IIT Guwahati)	Assistant Professor	Lasers and Advanced optics	03.10.2013	-
Dr. Vivek Kumar	PhD (IIT Delhi)	Assistant Professor	Nano Structured Materials	14.07.2015	-
Dr. Tribedi Bora	PhD (IIT Guwahati)	Assistant Professor	Magnetic Materials	06.07.2015	-
Dr. Wandahun Longtraí Reenbohn	PhD (NEHU)	Assistant Professor	Brownian Ratchets	06.07.2015	-
Dr. Kasilingam Senthilkumar	PhD	Assistant Professor	Nano-bio Plasmonics	14.07.2015	-

4. Research Thrust Areas:

- Liquidcrystals,
- Metal Oxide Semiconductors,
- Nano Science and Technology,
- Magnetic Oxide,
- Noise assisted Phenomena

5. Sponsored Research Projects:

Sl. No.	Project Title	Funding Agency	Funding Amount (Rs.)	Project Status	Duration
1	Studies on Orthoconicantiferroelectric Liquid Crystals PI: Dr. Ayon Bhattacharjee	DST-SERB	18.22	On going	3 years

6. Publications:

a. Journals:

- i. S. Saxena, P. Yogi, P. Yadav, S. Mishra, H. Pandey, H. M. Rai, **V. Kumar**, P. Sagdeo, and R. Kumar, Role of metal nanoparticles on porosification of silicon by metal induced etching (MIE), *Superlattices and Microstructures*, Vol.-94, Page-101, 2016.

- ii. P. Yogi, S. K. Saxena, S. Mishra, H. M. Rai, R. Late, **V. Kumar**, B. Joshi, P. R. Sagdeo and R. Kumar, Interplay between Phonon Confinement and Fano Effect on Raman line shape for semiconductor nanostructures: Analytical study, *Solid State Communication*, Vol.-230, Page-25, 2016.
- iii. S. K. Saxena, R. Borah, **V. Kumar**, H. M. Rai, R. Late, V. Sathe, P. R. Sagdeo and R. Kumar, Raman spectroscopy for study of interplay between phonon confinement and Fano effect in Silicon Nanowires, *Journal of Raman Spectroscopy*, Vol.-47, Page-283, 2016.
- iv. C. Baldacchini, **V. Kumar**, Anna R. Bizzarri and S. Cannistraro, Electron Tunnelling through Single Azurin Molecules can be on/off Switched by Voltage Pulses, *Applied Physics Letters*, Vol.-106, Page-183701, 2015.
- v. **V. Kumar**, G.B. Reddy and R. Pasricha, Thermal deoxygenation causes Photoluminescence shift from UV to blue region in lyophilized graphene oxide, *RSC Advances*, Vol.-5, Page-74342, 2015.
- vi. **T. Bora** and S. Ravi, Study of critical behavior in ferromagnetic in $\text{LaCr}_{0.3}\text{Mn}_{0.7}\text{O}_3$, *Journal of Magnetism and Magnetic Materials*, Vol.-doi:10.1016/j.jmmm.2016.02.011, 2016.
- vii. **T. Bora** and S. Ravi, Sign reversal of magnetization and tunable exchange bias field in $\text{NdCr}_{1-x}\text{Fe}_x\text{O}_3$ ($x = 0.05 - 0.20$), *Journal of Magnetism and Magnetic Materials*, Vol.-386, Page-85, 2015.
- viii. **T. Bora** and S. Ravi, Sign reversal of magnetization and ferromagnetism in $\text{NdCr}_{1-x}\text{Mn}_x\text{O}_3$ ($x = 0$ to 0.50), *Journal of Superconductivity and Novel Magnetism*, Vol.-28, Page-869, 2015.
- ix. J. Barman, **T. Bora** and S. Ravi, Study of exchange bias and training effect in NiCr_2O_3 , *Journal of Magnetism and Magnetic Materials*, Vol.-385, Page-93, 2015.
- x. N. Kumari, A. Ghosh, **A. Bhattacharjee**, Influence of Cu doping on the structural, electrical and optical properties of ZnO, *Pranama*, Vol.-84, Issue No.-4, Pages -621-635, 2015.

7. Faculty Serving in:

Dr Ayon Bhattacharjee is a member of the Editorial Boards of the following journals

- i. Transient, A Journal of Natural Sciences and Allied Subjects.
- ii. International Journal of Physics and Mathematical Sciences.
- iii. Prayas.
- iv. International Frontier Science Letters

Dr Ayon Bhattacharjee is a regular reviewer for the following journals:

- i. Materials Science and Engineering B (Elsevier).
- ii. Infrared Physics and Technology (Elsevier).
- iii. Journal of Chemical Engineering and Materials Science (JCEMS).
- iv. Applied Surface Science (Elsevier).
- v. Materials Science in Semiconductor Processing (Elsevier).
- vi. Indian Journal of Physics. (Springer)
- vii. International Journal of Physical Sciences.

Dr. Kasiligam Senthilkumar is an Associate Editor of World Research Journal of Applied Physics. He is also a regular reviewer for the following journals:

- i. Journal of Physics and Chemistry of Solids
- ii. Physica Status Solidi
- iii. Plasma Process and Polymer

8. Faculty Recharging:

- i. Four faculty of the Department have participated in a two-day pedagogy program titled, "Accreditation and Transformation of Technical Education to OBE"
- ii. One faculty of the Department have attended five days workshop organized by UGC at BHU titled, "Statistical Physics of Soft Matter."
- iii. One faculty of the Department have attended three days workshop organized by IIT Guwahati at IIT Guwahati titled, "National Workshop on Advance probing Techniques in TEM."
- iv. One faculty of the Department have attended four days workshop organized by FEBS - IUBMB at Spain titled "FEBS - IUBMB workshop on Biointeractomics"
- v. One faculty of the Department have attended six days school organized by ICTP and JNC SAR at JNC SAR Bengaluru titled "Nano, structural and single molecule approaches to biology."

9. Future Plans of the Department:

- i. Organization of international conference, national conference and workshops.
- ii. To enhance the overall get up of the department to make it more vibrant.
- iii. Organization of regular lecture session by eminent academic personalities.
- iv. More funding from government for encouraging student involvement in the research, to present research paper in the conference and also for collaboration research.
- v. Introducing new courses as per the changing need of the society.

Department of Chemistry

1. Introduction

The Department of Chemistry was established in 2012. At present, the department is offering two years M. Sc. degree in Chemistry as well as Ph.D. degree. In addition, the Department is supporting to various engineering departments for B.Tech. programmes at the institute.

2. Programmes Offered: M.Sc. and PhD in Chemistry

3. Faculty Profile:

Name	Designation	Qualification	Specialization	Date of Joining	Remarks
Dr. Paresh Nath Chatterjee	Assistant Professor	PhD (IIT Kharagpur)	Organic	14/01/2013	-
Dr. Gitish K. Dutta	Assistant Professor	PhD (IISc, Bangalore)	Organic	08/08/2013	-
Dr. Naba Kamal Nath	Assistant Professor	PhD (Hyderabad Univ.)	Inorganic	28/07/2015	-
Dr. Atanu Singha Roy	Assistant Professor	PhD (IIT Kharagpur)	Physical	23/07/2015	-
Dr. Tammineni Rajagopala Rao	Assistant Professor	PhD (Hyderabad Univ.)	Theoretical Chemistry	27/07/2015	Released on 18 Dec, 2015

4. List of Publications:

a. Journals:

- A. Singha Roy**, P. Ghosh, Characterization of the binding of flavanone hesperetin with chicken egg lysozyme using spectroscopic techniques: effect of pH on the binding, *Journal of Inclusion Phenomena and Macrocyclic Chemistry* 84, 2016, 21-34.
- P. Ghosh, **A. Singha Roy**, S. Chaudhury, S. Jana, K. Chaudhury, S. Dasgupta, Preparation of albumin based nanoparticles for delivery of fisetion and evaluation of its cytotoxic activity, *International Journal of Biological Macromolecules* 86, 2016, 408-417.
- A. Singha Roy**, D. R. Tripathy, S. Samanta, S. K. Ghosh, S. Dasgupta, DNA damaging, cell cytotoxicity and serum albumin binding efficacy of the rutin-Cu(II) complex, *Molecular BioSystems* 12, 2016, 1687-1701.
- A. Singha Roy**, P. Ghosh, S. Dasgupta, Glycation of human serum albumin alters its binding efficacy towards the dietary polyphenols: A comparative approach, *Journal of Biomolecular Structure & Dynamics* 2015, DOI: 10.1080/07391102.2015.1094749.
- Kyu Cheol Lee, Taehyo Kim, Seyeong Song, Yiho Kim, **Gitish K. Dutta**, Dong Suk Kim, Jin Young Kim and Changduk Yang "Medium bandgap copolymers based on carbazole and quinoxaline exceeding 1.0 V open-circuit voltages" *RSC Adv.*, 2016, 6, 17624-17631.
- Grégoire Guillon, **Tammineni Rajagopala Rao**, Susanta Mahapatra, and Pascal Honvault, "Quantum Dynamics of the $^{18}\text{O} + ^{36}\text{O}_2$ Collision Process", *J. Phys. Chem. A*, 2015, 119, 12512-12516.
- T. Rajagopala Rao**, G. Guillon, S. Mahapatra, P. Honvault, Differential cross sections and product rovibrational distributions for $^{16}\text{O} + ^{32}\text{O}_2$ and $^{18}\text{O} + ^{32}\text{O}_2$ collisions. *J. Phys. Chem. A*, 2015, 119, 11432-11439.

5. Sponsored Research Projects:

Sl. No.	Project Title	Funding Agency	Funding Amount (Rs. in Lakhs)	Project Status	Duration
1.	Development of 3-D Supramolecular Structure-Based Optoelectronic Materials Towards Photovoltaic Devices (Indo-Korean Project) PI: Dr. G. K. Dutta	DST-SERB	27.6556	On going	3 years
2.	Diketopyrrolopyrrole and isoindigo based luminescent conjugated polymers for colorimetric and fluorogenic sensors PI: Dr. G. K. Dutta	DST-SERB	22.38	On going	3 years
3.	Transition metal catalyzed cleavage of carbon-carbon bonds: synthetic, mechanistic and theoretical studies PI: Dr. P. N. Chatterjee	DST-SERB	24.70	On going	3 years
4.	An investigation into the molecular interaction of dietary polyphenols with hen egg white lysozyme using biophysical techniques PI: Dr. Atanu Singha Roy	DST-SERB	36.69	On going	3 years
5.	Smart Biomimetic Molecular Crystal for Energy Conversion PI: Dr. Naba Kamal Nath	DST-SERB	37.07	On going	3 years

6. Invited Talks Delivered:

- Invited talk in the National Symposium on "Natural Products: Prospects & Perspectives (NPPP2016)" in CSIR-NEIST Jorhat, (21-22 March 2016) by Dr. Naba Kamal Nath. Topic of the talk: Photoinduced Mechanical Effects in Molecular Crystals.
- Invited talk in the One Day Seminar at Taki Government College, West Bengal on January 11, 2016. Topic: π -Activation via Ir-Sn Catalysis & Route to Decorated Indenes, Furans and Pyrroles.

7. Awards Won/ Recognition Received: Four M. Sc. students from the Department have been selected for doing summer internship at IIT-Kanpur, IISER Mohali and Hyderabad Central University.

8. Conferences Attended:**a. Dr. Paresh Nath Chatterjee**

Exploring Recent Advances in Chemistry in Service for Mankind, held at Shillong College, July 30-31, 2015.

b. Dr. Gitish K. Dutta

Visiting Scientist to UNIST (S. Korea) under Indo_Korea Collaborative Research.

c. Dr. Atanu Singha Roy

National Symposium on Emerging Trends in Chemistry held at NEHU, Shillong, March, 28-29, 2016.

9. Laboratories Set-up: The department has set up a laboratory for M.Sc. programme as well as for Ph.D. programme. Besides, the Department is setting up an Analytical Instrument facility with Department of Physics at the Institute.

10. Workshop Attended

- Dr. Paresh Nath Chatterjee:** Workshop on 'Accreditation and Transformation of Technical Education to OBE', organized by NIT Meghalaya during January 22-23, 2016.
- Dr. Gitish K. Dutta:** Workshop on 'Accreditation and Transformation of Technical Education to OBE', organized by NIT Meghalaya during January 22-23, 2016
- Dr. Atanu Singha Roy:** Workshop on 'Accreditation and Transformation of Technical Education to OBE', organized by NIT Meghalaya during January 22-23, 2016.
- Dr. Naba Kamal Nath:** Workshop on 'Accreditation and Transformation of Technical Education to OBE', organized by NIT Meghalaya during January 22-23, 2016.

Department of Humanities & Social Sciences

1. Introduction

The Department of Humanities & Social Sciences is currently a support department with faculty in English and Management Studies. Two Research Scholars are working under the department. The Department has 2 faculty members and 1 visiting faculty. The Department also takes the help of 2 guest lecturers. The department also got the services of a Teaching Assistant during the Autumn Semester 2015.

2. Faculty Profile:

Name	Date of Joining	Qualification	Specialization	Remarks
Dr. Paonam Sudeep Mangang Assistant Professor	01.06.2012	PhD Manipur University	English Literature	Head of Department Chairman, Examination Committee Faculty-in-charge of Sports and Games
Mr. Amal Dev Sarma Assistant Professor	22.01.2013	MBA (NIT Durgapur) NET CAIIB (Indian Institute of Banking and Finance, Mumbai) Pursuing PhD	Management Studies	Convenor, Placement Committee Faculty Coordinator, Entrepreneurship Development Cell Member, IPR and Entrepreneurship Workshop Committee
Dr. Sujit Kumar Dutta Visiting Faculty	15.07.2015	PhD (IIT Kanpur) Post-doc (CEIAS) EHESS, Paris, France.	Rural Development & Entrepreneurship	Advisor, Training & Placement Advisor, Unnat Bharat Abhiyan

3. PhD Scholars of the Department:

Name	Date of Joining	Status	Specialization	Research Area
Ms. B. Samita Devi	August 2014	Full-Time	Literature	Gender Studies, August Strindberg
Mr. Rangehbok Lyngwa	January 2015	Part-Time	Literature	Dehumanization, Vijay Tendulkar

4. Publications:

a. Journals:

- Amal Dev Sarma** and B. Roychoudhury, Analysing Electronic Word-of-Mouth (eWOM) in Social Media for Consumer Insights – A Multidisciplinary Approach, International Journal of Science, Technology and Management, Vol. 04, Issue No. 01, Page Nos -978-990, 2015

b. Conferences/ Seminars:

- Paonam Sudeep Mangang** and **Ms. B. Samita Devi**, 'Representation of Gender Roles in Meitei Folktales', National Seminar on 'Gender and Folklore in Northeast India: Beliefs and Practices', NEHU, Shillong, 30-31 March 2016.
- Sujit Kumar Dutta**, "The Usage of MAP Species by the Tribal People of Tripura(India) for Health care and Earning Livelihood by Trading the same in the Sub-continent Market", International Congress on Technology – Engineering & Science(ICONTES), Kuala Lumpur, Malaysia, 13-14 Feb, 2016.

5. Activities of the Department:

- i. Organized a Workshop named “**Entrepreneurship and Business Plan Workshop (with Simulations)**” in collaboration with BIZWIZ Learning to impart entrepreneurial competence to the students of NIT Meghalaya and neighbouring educational institutes on March 6, 2016.
- ii. Arranged various extra tutorial classes for students weak in communication skills.
- iii. Arranged classes on communication skills for senior students to aid in their placement activities.

6. Invited Talks Delivered:

- i. **Sujit Kumar Dutta** was invited by the Commerce Department of Gauhati University as key note speaker on ‘Resource Endowment and its Allocation in North East India’ held on 14th November, 2015.
- ii. **Amal Dev Sarma** was a resource person on “Mining Electronic Word-of-Mouth (eWOM) Data from Web 2.0 Technologies for Business and Management Insights”, Workshop on Information Technology and its Applicability in Other Areas, May 26, 2015, ICFAI University Meghalaya

7. Conferences/Seminars/Workshops Attended:

- a. **Amal Dev Sarma** attended a Workshop on “Accreditation and Transformation of Technical Education” during January 22 – 23, 2016 organised by National Institute of Technology Meghalaya (NIT Meghalaya), Shillong, India.

8. Any Other Notable Information:

- a. **Paonam Sudeep Mangang** and **Amal Dev Sarma** are serving as the Editor and the Associate Editor of ‘Spectrum: An International Journal of Humanities and Social Sciences’ 2319-6076. Two issues of the journal have been published successfully during the academic year.
- b. **Paonam Sudeep Mangang** is serving as a Member of International Editorial Board of ‘IOSR Journal of Humanities and Social Sciences’ (IOSR-JHSS). e-ISSN 2279-0837, p-ISSN 2279-0845.
- c. **Paonam Sudeep Mangang** is serving as a Member of Editorial Board of ‘Modern Research Studies: An International Journal of Humanities and Social Sciences’. ISSN 2349-2147.
- d. **Paonam Sudeep Mangang** completed a translation assignment given by State Resource Centre, NEHU.
- e. **Amal Dev Sarma** is Counsellor of Master of Business Administration (MBA) and Master of Commerce (M.Com.) programmes of the School of Management Studies, Indira Gandhi National Open University (IGNOU), Shillong Regional Centre.
- f. **Amal Dev Sarma** is Life Member of Indian Institute of Banking and Finance (IIBF), Mumbai, India
- g. **Amal Dev Sarma** is Life Member of North East India Council for Social Science Research (NEICSSR), Shillong, India
- h. **Sujit Kumar Dutta** is a Member of GEF UNDP SGP, India now.
- i. **Sujit Kumar Dutta**, a book entitled ‘Sustainable Agricultural Development in Nagaland: Roles & Responsibilities of Village Level Institutions’ (Currently in press).
- j. **Paonam Sudeep Mangang** has been awarded a start-up project by NIT Meghalaya on the topic ‘Stigma and Exclusion: A Study of Fits, Seizures and Epilepsy in Literature’ Duration of Project: 2015 to 2017.
- k. **Ranghebok Lyngwa**, “Exploring innovative means to enhance the Teaching-Learning of the skill of writing the English language for specific purpose”, published by Spectrum: An international journal of Humanities and Social Sciences, Jul-Dec 2015, Vol.3, Issue 2, ISSN 2319-6076.
- l. **Ranghebok Lyngwa**, “Drama for Social Change with special reference to selected plays of Vijay Tendulkar”, in the International Journal of English Language, Literature and Translation Studies (IJELR) ISSN: 2349-9451, Vol:3 No. 1, Jan 2016.
- m. Derek Langstieh and **Ranghebok Lyngwa**, “Water disaster risk reduction management”, AICTE-NEQIP Sponsored National Seminar on Disaster Management: Issues and Challenges, organised by PCPS Girl’s Polytechnic, Guwahati, Assam in collaboration with Assam disaster management authority (ASDMA), on the 3rd & 4th November, 2015.
- n. **B. Samita Devi**, “The Use of Evil Designs in August Strindberg’s play The Father” in Spectrum: An International Journal of Humanities and Social Sciences, Jul-Dec 2015, Vol. 3, Issue 2, ISSN 2319-6076.

ANNUAL ACCOUNTS



कार्यालय, महालेखाकार (लेखापरीक्षा)
मेघालय, शिलांग-793 001

OFFICE OF THE
ACCOUNTANT GENERAL (AUDIT)
MEGHALAYA, SHILLONG-793 001

EPABX- 0364-2228861/62/63; FAX-2223494
पत्र संख्या/Ltr.No. ES-II/4-19/ 2016-17/ 493

Email: agauMeghalaya.gov.in
दिनांक/Date : 25 October 2016

To,

The Secretary to the Government of India,
Ministry of Human Resource Development,
(Department of Higher Education),
Room No-128, C Wing,
ShastriBhavan,
New Delhi – 110001.

Sub: Separate Audit Report on the accounts of the National Institute of Technology, Meghalaya for the year ended 31 March 2016.

Sir,

I am to forward herewith the Separate Audit Report on the accounts of the **National Institute of Technology (NIT), Meghalaya** for the year **2015-16** and a set of audited **Annual Accounts of NIT** for the year **2015-16**.

2. The Hindi version of the Separate Audit Report will be prepared by the NIT.
3. The Separate Audit Report and the Annual Accounts sent herewith may please be placed before both Houses of Parliament as soon as possible. The date(s) of placing of the Report and Accounts may please be intimated and ten copies of the Report, placed before Parliament, may please be sent to this office for record.
4. The Separate Audit report may please be treated as **Confidential** till it is placed before the Parliament.

Kindly acknowledge receipt.

Yours faithfully,

Encl: As stated above

Sd/-
Accountant General (Audit)

Speed Post/Confidential

Ltr.No. ES-II/4-19/2016-17/ 494

Date: 25 October 2014

Copy of the Separate Audit Report on the accounts of the **National Institute of Technology (NIT)** for the year **2015-16** is forwarded to:

**Director,
National Institute of Technology (NIT),
Bijini Complex, Laitumkhrah,
Shillong – 793003.**

2. Necessary arrangement may please be made for preparation of Hindi version of the Separate Audit Report and issue of the same to the Government of India, Ministry of Human Resource Development with copy to this office.
3. The date(s) of the placing of the Separate Audit Report and Annual Accounts before both Houses of Parliament may please be intimated early.
4. The Separate Audit Report sent herewith may please be treated as **Confidential** till it is placed before both Houses of Parliament.

Kindly acknowledge receipt.


**Sr. Dy. Accountant General
Economic Sector-II**

**Separate Audit Report of the Comptroller and Auditor General of India on
the accounts of National Institute of Technology, Meghalaya for the year
ended 31 March 2016**

We have audited the attached Balance Sheet of the National Institute of Technology (NIT), Meghalaya as at 31 March 2016, the Income and Expenditure Account and Receipts and Payments Account for the year ended on that date under Section 19(2) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 read with Section 22(2) of the National Institute of Technology (NIT) Act, 2007. These financial statements are the responsibility of the NIT's Management. Our responsibility is to express an opinion on these financial statements based on our audit.

2. This Separate Audit Report contains the comments of the Comptroller & Auditor General of India (CAG) on the accounting treatment only with regard to classification, conformity with the best accounting practices, accounting standards and disclosure norms, etc. Audit observations on financial transactions with regard to compliance with the Law, Rules & Regulations (Propriety and Regularity) and efficiency-cum-performance aspects, etc., if any, are reported through Inspection Reports/CAG's Audit Reports separately.

3. We have conducted our audit in accordance with auditing standards generally accepted in India. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material mis-statements. An audit includes examining, on a test basis, evidences supporting the amounts and disclosure in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of financial statements. We believe that our audit provides a reasonable basis for our opinion.

4. Based on our audit, we report that:

I. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit;

II. The Balance Sheet and Income and Expenditure Account/Receipt and Payment Account dealt by this Report have been drawn in the revised format of accounts prescribed by Ministry of Human Resources Development, Government of India for Central Educational Institutions.

III. In our opinion, proper books of accounts and other relevant records have been maintained by the NIT as required under Section 22(1) of the NIT Act, 2007 in so far as it appears from our examination of such books;

IV. We further report that:

A. Balance Sheet

A1. Current Liabilities and Provisions (Schedule-3) - ₹2326.77 lakh

1. Others-Provision for Expenses-NIL

(i) The above does not include an amount of ₹63.65 lakh being the provision of salary for the month of March 2016. This has resulted in understatement of Current Liabilities and Provisions and Deficit for the year by ₹ 63.65 lakh each.

(ii) The above does not include the Leave salary contribution in respect of one faculty for the period 01 April 2015 to 31 March 2016 amounting ₹0.57 lakh. This has resulted in understatement of Current Liabilities and Provisions and Deficit for the year by ₹ 0.57 lakh each.

(iii) The Institute has not made any provision for Auditors remuneration during the year.

2. Other Liabilities-₹ 144.44 lakh

The above does not include ₹ 1.49 lakh being the value of cheques issued prior to December 2015 but were not presented for payment up to March 2016. As the validity of the cheque is only for three months, the cheques have become stale and hence liability should have been created. This has, therefore resulted in Understatement of Current Liabilities – Other Liabilities as well as Current Assets, Loans and Advances by ₹ 1.49 lakh.

A2. Loans, Advances and Deposits (Schedule-8) - ₹2070.71 lakh

1. Sundry Receivables - ₹4.85 lakh

The above includes ₹ 0.19 lakh as amount receivable from a faculty member. As the entire amount has been fully recovered from him during the year 2015-16, the said amount should have been written off from Sundry Receivables. This has resulted in overstatement of Loans, Advances and Deposits and understatement of Deficit for the year by ₹0.19 lakh each.

B. General

(i) Confirmation of balances in banks and fixed deposits was not obtained by the Institute from the financial institutions.

(ii) Confirmation of Debtors/Loans and Advances were also not taken from respective parties.

(iii) The Ministry of Human Resource Development (MHRD), Government of India has made it mandatory on the part of Central Educational Institutions to prepare their Annual Accounts in the Revised Format of Accounts from 2014-15 onwards. However, the following deviations from the Revised Format of Accounts were noticed:

(a) The staff payments and benefits under Staff Payments and Benefits (Schedule-15) have not been classified separately for teaching staff, non-teaching staff and adhoc staff. Further, details of arrears of Dearness Allowances, Salary Arrears due to increment were not shown

separately. Statutory obligations towards Provident Fund, New Pension Scheme, Employees' State Insurance and Retirement Benefits etc have not been disclosed item-wise.

(b) A separate Schedule (15 A) for Employees Retirement and Terminal Benefits was not created.

(c) The liabilities of Retirement benefits of the Institute have not been provided on actuarial basis in contravention to Accounting Standard-15.

(d) The details of the Bank Accounts have not been annexed along with Current Assets (Schedule-7).

C. Grants-in-Aid

Grants-in-aid had an opening balance of ₹19.85 crore as on 01 April 2015. During the year 2015-16, an amount of ₹48.04 crore was received and the Internal Revenue Generation (IRG) was ₹1.31 crore. Out of which, ₹31.16 crore was utilized for Capital Expenditure and ₹19.64 crore (which includes Grant - ₹18.33 crore and IRG - ₹1.31 crore) was utilized for Revenue Expenditure, leaving an unspent balance of ₹18.40 crore as on 31 March 2016.

V. Subject to our observations in the preceding paragraphs, we report that the Balance Sheet, Income and Expenditure Account and Receipts and Payments Account dealt with by this report are in agreement with the books of accounts; and


VI. In our opinion and to the best of our information and according to the explanations given to us, the said financial statements read together with the Accounting Policies and Notes on Accounts, and subject to the significant matters stated above and other matters mentioned in **Annexure** to this Audit Report give a true and fair view in conformity with accounting principles generally accepted in India:

(a) In so far as it relates to the Balance Sheet, of the state of affairs of the National Institute of Technology (NIT), Meghalaya as at 31 March 2016; and

(b) In so far as it relates to Income and Expenditure Account of the deficit for the year ended on that date.

For and on behalf of the Comptroller and Auditor General of India.

Place: Shillong
Date: 25 October 2016


(Stephen Hongray)
Accountant General (Audit), Meghalaya

Annexure

1. Adequacy of Internal Audit System.

- The Internal Audit is not adequate as the Institute does not have an independent Internal Audit wing and the Internal Audit works is outsourced to a Chartered Accountant.
- No Internal Audit Manual has also been prepared/established by the Institute.

2. Adequacy of Internal Control System.

Evaluation of the internal control system of the Institute revealed weakness in the following aspects:

- (i) The Institute has not yet developed any Internal Control Manual relating to Accounts, Procurement, Administration and Personnel etc. for effective Internal Control Systems.
- (ii) Confirmation of Bank balances and Fixed Deposit was not obtained by the Institute.
- (iii) Confirmation of balance from debtors/loans & advances were also not obtained from respective parties.

3. System of Physical Verification of Fixed Assets.

Physical Verification of assets was carried out by the Institute in all their Departments during the year ended 31 March 2016. However, the physically verified assets were not compared with the assets in its books of accounts. In the absence of such comparative report, the authenticity of the value of Fixed Assets in the accounts could not be verified in audit.

4. System of physical verification of Inventory.

Physical Verification of Inventory was not carried out by the Institute during the year ended 31 March 2016.

5. Regularity in payment of statutory dues.

The Institute was prompt in making payment of statutory dues.


Audit Officer
Economic Sector-II

BALANCE SHEET AS AT 31ST MARCH 2016

[Amount in ₹]

SOURCES OF FUNDS	Schedule	Current Year	Previous Year
CORPUS/CAPITAL FUND	1	80,85,75,047	73,55,00,688
DESIGNATED/ EARMARKED / ENDOWMENT FUNDS	2	4,45,06,600	2,64,15,100
CURRENT LIABILITIES & PROVISIONS	3	23,26,77,463	2,62,08,717
TOTAL		1,08,57,59,110	78,81,24,505
APPLICATION OF FUNDS	Schedule	Current Year	Previous Year
FIXED ASSETS	4		
Tangible Assets		20,02,27,483	14,06,67,300
Intangible Assets		1,27,05,300	60,18,950
Capital Works-In-Progress		60,29,88,322	38,91,45,389
INVESTMENTS FROM EARMARKED / ENDOWMENT FUNDS	5		
Long Term		-	-
Short Term		-	-
INVESTMENTS - OTHERS	6	-	-
CURRENT ASSETS	7	6,27,67,214	8,76,11,414
LOANS, ADVANCES & DEPOSITS	8	20,70,70,791	16,46,81,452
TOTAL		1,08,57,59,110	78,81,24,505
SIGNIFICANT ACCOUNTING POLICIES		23	
CONTINGENT LIABILITIES AND NOTES TO ACCOUNTS		24	

For NIT Meghalaya

Director

Assistant Registrar

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2016

[Amount in ₹]

Particulars	Schedule	Current Year	Previous Year
INCOME			
Academic Receipts	9	76,87,900	56,42,150
Grants / Subsidies	10	18,32,92,978	17,24,23,029
Income from investments	11	33,74,508	38,97,617
Interest earned	12	4,16,190	6,57,020
Other Income	13	16,23,101	7,10,016
Prior Period Income	14	-	-
TOTAL (A)		19,63,94,678	18,33,29,832
EXPENDITURE			
Staff Payments & Benefits (Establishment expenses)	15	9,48,65,100	5,85,84,389
Academic Expenses	16	3,16,97,033	2,17,93,403
Administrative and General Expenses	17	4,91,81,427	4,53,41,340
Transportation Expenses	18	90,88,780	-
Repairs & Maintenance	19	2,00,94,824	1,85,43,694
Finance costs	20	4,811	1,59,388
Depreciation	4	4,09,67,288	2,40,81,976
Other Expenses	21	-	-
Prior Period Expenses	22	-	39,18,839
TOTAL (B)		24,58,99,263	17,24,23,029
Balance being excess of Income over Expenditure (A-B)		(4,95,04,586)	1,09,06,803
Transfer to / from Designated Fund			
Building fund			
Others (specify)			
Balance Being Surplus / (Deficit) Carried to Capital Fund		(4,95,04,586)	1,09,06,803
Significant Accounting Policies	23		
Contingent Liabilities and Notes to Accounts	24		

For NIT Meghalaya

Director

Assistant Registrar

SCHEDULE 1 - CORPUS/CAPITAL FUND

[Amount in ₹]

	Particulars	Current Year	Previous Year
	Balance at the beginning of the year	73,55,00,688	29,70,16,914
Add:	Contributions towards Corpus/Capital Fund	-	-
Add:	Grants from UGC, Government of India and State Government to the extent utilized for capital expenditure	31,15,73,973	42,75,76,971
Add:	Assets Purchased out of Earmarked Funds	-	-
Add:	Assets Purchased out of Sponsored Projects, where ownership vests in the institution	-	-
Add:	Assets Donated/Gifts Received	-	-
Add:	Depreciation for prior period	94,82,781	-
Add:	Excess of Income over expenditure transferred from the Income & Expenditure Account	-	1,09,06,803
(Deduct)	B/F Unutilized Grant transferred to Current Liabilities	(19,84,77,809)	-
	Total	85,80,79,633	73,55,00,688
(Deduct)	Deficit transferred from the Income & expenditure Account	4,95,04,586	-
	Balance at the year end	80,85,75,047	73,55,00,688

SCHEDULE 2 - DESIGNATED/ EARMARKED / ENDOWMENT FUNDS

[Amount in ₹]

Particulars	Fund wise Breakup		Total	
	Internal Resources Fund	Endowment Funds	Current Year	Previous Year
A.				
a) Opening balance	2,64,15,100	-	2,64,15,100	1,32,69,350
b) Additions during the year	1,80,91,500	-	1,80,91,500	1,31,45,750
c) Income from investments made of the funds	-	-	-	-
d) Accrued Interest on investments/Advances	-	-	-	-
e) Interest on Savings Bank a/c	-	-	-	-
f) Other additions (Specify nature)	-	-	-	-
Total (A)	4,45,06,600	-	4,45,06,600	2,64,15,100
B.				
Utilisation/Expenditure towards objectives of funds				
ii) Capital Expenditure	-	-	-	-
ii) Revenue Expenditure	-	-	-	-
Total (B)	-	-	-	-
Closing balance at the year end (A - B)	4,45,06,600	-	4,45,06,600	2,64,15,100

SCHEDULE 3 - CURRENT LIABILITIES & PROVISIONS

[Amount in ₹]

	Current Year	Previous Year
A. CURRENT LIABILITIES		
1. Deposits from staff	1,26,952	1,25,460
2. Deposits from students	28,75,095	28,08,000
3. Sundry Creditors		
a) For Goods & Services	-	-
b) Others	-	-
4. Deposit-Others (including EMD, Security Deposit) (As per Annexure 'A')	87,04,777	1,09,27,745
5. Statutory Liabilities (GPF, TDS, WC TAX, CPF, GIS, NPS): (As per Annexure 'B')		
a) Overdue	-	-
b) Others	13,63,887	19,75,254
6. Other Current Liabilities		
a) Salaries	-	-
b) Receipts against sponsored projects	1,11,06,090	19,16,590
c) Receipts against sponsored fellowships & scholarships	9,94,995	5,52,500
d) Unutilised Grants	18,39,85,858	-
e) Grants in advance	-	-
f) Other funds	5,38,831	2,20,250
g) Other liabilities (As per Annexure 'C')	1,44,43,680	76,82,918
Total (A)	22,41,40,165	2,62,08,717
B. PROVISIONS		
1. For Taxation	-	-
2. Gratuity	-	-
3. Superannuation Pension	-	-
4. Accumulated Leave Encashment	85,37,298	-
5. Trade Warranties/Claims	-	-
6. Others - Provision for Expenses	-	-
Total (B)	85,37,298	-
Total (A+ B)	23,26,77,463	2,62,08,717

Note: Unutilized grants 6 (d) will include grants received in advance for next year.

SCHEDULE 3(a) - SPONSORED PROJECTS

[Amount in ₹]

SI No.	Name of Project	Opening Balance		Receipts / Recoveries During the Year	Total	Expenditure During the Year	Closing Balance	
		Credit	Debit				Credit	Debit
1	2	3	4	5	6	7	8	9
1	NIT R&D Account	2,43,706	-	1,21,75,513	1,24,19,219	92,77,003	31,42,216	-
2	Sponsored Project - SERB	680	-	-	680	680	-	-
3	Sponsored Project - CE/01	1,61,378	-	5,65,353	7,26,731	6,15,597	1,11,134	-
4	Sponsored Project - CE/02	15,10,826	-	47,370	15,58,196	9,87,702	5,70,494	-
5	PHD-Visvesvaraya	-	-	8,17,830	8,17,830	5,98,790	2,19,040	-
6	Sponsored Project/ Chem/Indo-Korean	-	-	9,55,555	9,55,555	1,66,633	7,88,922	-

[Amount in ₹]

SI No.	Name of Project	Opening Balance		Receipts / Recoveries During the Year	Total	Expenditure During the Year	Closing Balance	
		Credit	Debit				Credit	Debit
1	2	3	4	5	6	7	8	9
7	Sponsored Project/ Chem/Paresh	-	-	15,02,466	15,02,466	3,08,191	11,94,275	-
8	Sponsored Project/ COMP/RAY	-	-	11,49,200	11,49,200	-	11,49,200	-
9	Sponsored Project/ DeITY/K. Datta	-	-	10,00,000	10,00,000	40,487	9,59,513	-
10	Sponsored Project/ DST/Chem/Gitish	-	-	13,02,137	13,02,137	9,809	12,92,328	-
11	Sponsored Project/ DST/Nandi	-	-	20,95,407	20,95,407	20,95,407	-	-
12	Sponsored Project SDMA/Marthong	-	-	4,00,658	4,00,658	3,33,162	67,496	-
13	Sponsored Project/ SMDP/Dandapat	-	-	16,95,000	16,95,000	83,528	16,11,472	-
	Total	19,16,590	-	2,37,06,489	2,56,23,079	1,45,16,989	1,11,06,090	-

Notes:

1. The Projects may be listed agency-wise, with sub-totals for each agency.
2. The total of Col. 8 (Credit) will appear under the above head on the liabilities side of the Balance Sheet (Schedule 3).
3. The total of Col. 9 (Debit) will appear as Receivables in Schedule 8, Loans, Advances and Deposits, on the Assets side of the Balance Sheet.

SCHEDULE 3(b) - SPONSORED FELLOWSHIPS AND SCHOLARSHIPS

[Amount in ₹]

SI No.	Name of Sponsor	Opening Balance		Transactions During the Year		Closing Balance	
		Credit	Debit	Credit	Debit	Credit	Debit
1	2	3	4	5	6	7	8
1	Scholarship - Top Class	4,10,630	-	-	-	4,10,630	-
2	External Individual Scholarships	1,41,870	-	9,02,745	4,60,250	5,84,365	-
	Total	5,52,500	-	9,02,745	4,60,250	9,94,995	-

Notes:

1. The total of Column 7, (Credit) will appear under the above head, on the liabilities side of the Balance Sheet (Schedule 3)
2. The total of Column 8 (Debit) will appear as Receivables on the Assets side of the Balance Sheet in Schedule 8 (Loans, Advances and Deposits).

SCHEDULE 3(c) - UNUTILIZED GRANTS FROM UGC, GOVERNMENT OF INDIA AND STATE GOVERNMENTS

[Amount in ₹]

	Current Year	Previous Year
A Plan Grants: Government of India		
Balance B/F	19,84,77,809	15,34,09,985
Add: Receipts during the year	48,03,75,000	60,00,00,000
Total (a)	67,88,52,809	75,34,09,985
Less: Refunds	-	-
Less: Utilized for Revenue Expenditure	18,32,92,978	41,82,66,323
Less: Utilized for Capital Expenditure	31,15,73,973	13,66,65,853
Total (b)	49,48,66,951	55,49,32,176
Unutilized carried forward (a-b)	18,39,85,858	19,84,77,809
B UGC Grants: Plan		
Balance B/F	-	-
Add: Receipts during the year	-	-
Total (a)	-	-
Less: Refunds	-	-
Less: Utilized for Revenue Expenditure	-	-
Less: Utilized for Capital Expenditure	-	-
Total (b)	-	-
Unutilized carried forward (a-b)	-	-
C UGC Grants: Non Plan		
Balance B/F	-	-
Add: Receipts during the year	-	-
Total (a)	-	-
Less: Refunds	-	-
Less: Utilized for Revenue Expenditure	-	-
Less: Utilized for Capital Expenditure	-	-
Total (b)	-	-
Unutilized carried forward (a-b)	-	-
D Grants from State Government		
Balance B/F	-	-
Add: Receipts during the year	-	-
Total (a)	-	-
Less: Utilized for Revenue Expenditure	-	-
Less: Utilized for Capital Expenditure	-	-
Total (b)	-	-
Unutilized carried forward (a-b)	-	-
Grand Total (A+B+C+D)	18,39,85,858	19,84,77,809

Notes:

Unutilized grants includes advances on Capital Account

Unutilized grants include grants received in advance for the next year

Unutilized grants are represented on the Assets side by Bank balances, Short term Deposits with Banks and Advances on Capital Account

SCHEDULE 4 - FIXED ASSETS

S. No.	Assets Heads	Gross Block			Closing Balance	Depreciation for the Year			Net Block		
		Opening Balance On 01.04.2015	Additions	Deductions		Depreciation Opening Balance	Depreciation for the Year	Deductions/ Adjustment	Total Depreciation	31.03.2016	31.03.2015
1	Land	-	-	-	-	-	-	-	-	-	-
2	Site Development	-	-	-	-	-	-	-	-	-	-
3	Buildings	-	-	-	-	-	-	-	-	-	-
4	Roads & Bridges	-	-	-	-	-	-	-	-	-	-
5	Tubewells & Water Supply	-	4,46,375	-	4,46,375	-	8,927	-	8,927	4,37,448	-
6	Sewerage & Drainage	-	-	-	-	-	-	-	-	-	-
7	Electrical Installation and equipment	-	27,73,104	-	27,73,104	-	1,38,655	-	1,38,655	26,34,449	-
8	Plant & Machinery	-	-	-	-	-	-	-	-	-	-
9	Scientific & Laboratory Equipment	-	8,22,78,601	-	8,22,78,601	-	65,82,288	28,26,275	94,08,563	7,28,70,038	-
10	Office Equipment	9,53,47,232	6,32,095	4,24,78,718	5,35,00,609	1,34,92,866	40,12,546	(46,85,123)	1,28,20,289	4,06,80,320	8,18,54,366
11	Audio Visual Equipment	-	-	-	-	-	-	-	-	-	-
12	Computers & Peripherals	4,59,81,341	1,40,82,384	-	6,00,63,725	2,43,00,474	1,20,12,745	(77,01,438)	2,86,11,781	3,14,51,944	2,16,80,867
13	Furniture, Fixtures & Fittings	4,13,65,882	1,20,72,345	-	5,34,38,227	72,21,898	40,07,867	(8,43,202)	1,03,86,563	4,30,51,664	3,41,43,984
14	Vehicles	15,43,380	-	-	15,43,380	2,70,092	1,54,338	38,584,00	4,63,014	10,80,366	12,73,288
15	Lib. Books & Scientific Journals	46,52,536	53,26,359	-	99,78,895	29,37,741	9,97,890	(19,77,990)	19,57,641	80,21,254	17,14,795
16	Small Value Assets	-	-	-	-	-	-	-	-	-	-
17	Total (A)	18,88,90,371	11,76,11,263	4,24,78,718	26,40,22,916	4,82,23,071	2,79,15,256	(1,23,42,894)	6,37,95,433	20,02,27,483	14,06,67,300
	Capital Work in Progress (B)	38,91,45,389	21,38,42,933	-	60,29,88,322	-	-	-	-	60,29,88,322	38,91,45,389
S. No.	Intangible Assets	Opening Balance On 01.04.2015	Additions	Deductions	Closing Balance	Depreciation Opening Balance	Amortization for the Year	Deductions/ Adjustments	Total Amortization /Adjustments	Balance as on 31.03.2016	Balance as on 31.03.2015
18	Computer Software	1,00,31,583	1,42,80,166	-	2,43,11,749	40,12,633	97,24,700	28,60,113	1,65,97,446	77,14,303	60,18,950
19	E-Journals	-	83,18,329	-	83,18,329	-	33,27,332	-	33,27,332	49,90,997	-
20	Patents	-	-	-	-	-	-	-	-	-	-
Total (C)		1,00,31,583	2,25,98,495	-	3,26,30,078	40,12,633	1,30,52,032	28,60,113	1,99,24,778	1,27,05,300	60,18,950
Grand Total (A + B + C)		58,80,67,343	35,40,52,691	4,24,78,718	89,96,41,316	5,22,35,704	4,09,67,288	(94,82,781)	8,37,20,211	81,59,21,105	53,58,31,639

Notes:

The figure in Column "Deductions" under Gross Block against the head Capital Work in Progress represents the transfer from Work in Progress to Assets during the year. A16The figures in column "Additions during the year under Gross Block against Assets 1 to 14 include transfer from Work in Progress during the year, as well as further acquisitions during the year.

SCHEDULE 5 - INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS

[Amount in ₹]

		Current Year	Previous Year
1	In Central Government Securities	-	-
2	In State Government Securities	-	-
3	Other approved Securities	-	-
4	Shares	-	-
5	Debentures and Bonds	-	-
6	Term Deposits with Banks	-	-
7	Others (to be specified)	-	-
	Total	-	-

SCHEDULE 6 - INVESTMENTS — OTHERS

[Amount in ₹]

		Current Year	Previous Year
1	In Central Government Securities	-	-
2	In State Government Securities	-	-
3	Other approved Securities	-	-
4	Shares	-	-
5	Debentures and Bonds	-	-
6	Others	-	-
	TOTAL	-	-

SCHEDULE 7 - CURRENT ASSETS

[Amount in ₹]

	Current Year	Previous Year
1. Stock:		
a) Stores and Spares	-	-
b) Loose Tools	-	-
c) Publications	-	-
d) Laboratory chemicals, consumables and glass ware	-	-
e) Building Material	-	-
f) Electrical Material	-	-
g) Stationery	-	-
h) Water supply material	-	-
2. Sundry Debtors:		
a) Debts Outstanding for a period exceeding six months	-	-
b) Others	-	-
3. Cash and Bank Balances		
a) With Scheduled Banks:		
In Current Accounts	3,16,83,516	4,41,51,593
In term deposit Accounts	1,09,41,528	3,00,00,000
In Savings Accounts	2,01,42,170	1,34,59,821
b) With non-Scheduled Banks:		
In term deposit Accounts	-	-
In Savings Accounts	-	-
c) Cash in hand:	-	-
4. Post Office- Savings Accounts	-	-
TOTAL	6,27,67,214	8,76,11,414

Note: Annexure A shows the details of Bank Accounts

SCHEDULE 8 - LOANS, ADVANCES & DEPOSITS

[Amount in ₹]

	Current Year	Previous Year
1. Advances to employees: (Non-interest bearing)		
a) Salary	1,32,942	3,29,156
b) Festival	-	-
c) Medical Advance	-	-
d) Other - PDA Advance	2,81,565	36,756
2. Long Term Advances to employees: (Interest bearing)		
a) Vehicle loan	-	-
b) Home loan	-	-
c) Others (to be specified)	-	-
3. Advances and other amounts recoverable in cash or in kind or for value to be received:		
a) On Capital Account	-	70,00,000
b) To Suppliers	-	-
c) Others - Travelling Advance	25,500	25,500
d) Others - Temporary Advance	8,33,300	12,07,500
e) Advance against Rent	20,87,938	18,07,938
4. Prepaid Expenses		
a) Insurance	-	-
b) Other expenses -Leased Line Charges	9,92,700	11,91,240
5. Deposits		
a) Telephone	-	-
b) Lease Rent	-	-
c) Electricity	-	-
d) AICTE, if applicable	-	-
e) Others	14,44,940	14,44,940
6. Income Accrued:		
a) On Investments from Earmarked/ Endowment Funds	-	-
b) On Investments-Others	-	-
c) On Loans and Advances	-	-
d) Others (includes income due unrealized) (Term Deposits)	7,86,490	15,62,024
7. Other - Current assets receivable from UGC/sponsored projects		
a) Debit balances in Sponsored Projects	-	-
b) Debit balances in Sponsored Fellowships & Scholarships	-	-
c) Grants Receivable	20,00,00,000	15,00,00,000
d) Other receivables from UGC	-	-
8. Claims Receivable		
Sundry Receivables	4,85,416	76,398
TOTAL	20,70,70,791	16,46,81,452

Note:

1. If revolving funds have been created for House Building, Computer and Vehicle advances to employees, the advances will appear as part of Earmarked/endowment Funds. The balance against these interest —bearing advances will not appear in this schedule.

SCHEDULE 9 - ACADEMIC RECEIPTS

[Amount in ₹]

		Current Year	Previous Year
A. FEES FROM STUDENTS			
A. Academic			
1	Admission Fee	-	-
2	Enrollment and Registration Fee	7,70,800	4,47,400
3	Application Fee	1,89,750	1,28,000
4	Summer Term Course Fee	1,23,000	40,000
5	Laboratory and Internet Fee	24,55,000	18,45,000
6	Library Fee	3,79,800	2,82,000
7	Provisional Certificate Fee	24,900	20,700
	Total (A)	39,43,250	27,63,100
B. Examinations			
1	Examination Fee and Grade Fee	7,31,800	5,58,200
	Total (B)	7,31,800	5,58,200
C. Other Fees			
1	Identity Card Fee	37,350	28,350
2	Hostel Admission Fee	94,500	75,500
3	Hostel Seat Rent	19,18,000	14,78,000
4	Hostel Electricity and Water Charges	9,63,000	7,39,000
	Total (C)	30,12,850	23,20,850
D. Sale of Publications			
	1.Sale of Admission forms	-	-
	2.Sale of syllabus and Question Paper, etc.	-	-
	3.Sale of prospectus including admission forms	-	-
	Total (D)	-	-
E. Other Academic Receipts			
	1.Registration fee for workshops, programmes	-	-
	2.Registration fees (Academic Staff College)	-	-
	Total (E)	-	-
Grand Total (A+B+C+D+E)		76,87,900	56,42,150

Note:

In case fees like entrance fee, subscriptions etc are material and are in the nature of capital receipts, such amount should be recognized to the Capital Fund. Otherwise such fees will be appropriately incorporated in this schedule.

SCHEDULE 10 - GRANTS / SUBSIDIES (IRREVOCABLE GRANTS RECEIVED)

[Amount in ₹]

Particulars	Plan			Total Plan	Non Plan UGC	Current Year Total	Previous Year Total
	Govt. of India	UGC					
		Plan	Specific Schemes				
Balance B/F	19,84,77,809	-	-	19,84,77,809	-	19,84,77,809	15,34,09,985
Add: Receipts during the year	48,03,75,000	-	-	48,03,75,000	-	48,03,75,000	60,00,00,000
Total	67,88,52,809	-	-	67,88,52,809	-	67,88,52,809	75,34,09,985
Less: Refund to UGC Balance	-	-	-	-	-	-	-
Less: Utilised for Capital expenditure (A)	31,15,73,973	-	-	31,15,73,973	-	31,15,73,973	41,82,66,323
Balance	36,72,78,836	-	-	36,72,78,836	-	36,72,78,836	33,51,43,662
Less: Utilized for Revenue Expenditure (B)	18,32,92,978	-	-	18,32,92,978	-	18,32,92,978	13,66,65,853
Balance C/F (C)	18,39,85,858	-	-	18,39,85,858	-	18,39,85,858	19,84,77,809

A-Appears as addition to Capital Fund as well as additions to Fixed Assets during the year.

B-Appears as income in the Income & Expenditure Account.

C- (I) Appears under Current Liabilities in the Balance Sheet and will become the opening balance next year.

(II) Represented by Bank balances, Investments and Advances on the assets side.

SCHEDULE 11 - INCOME FROM INVESTMENTS

[Amount in ₹]

Particulars	Earmarked / Endowment Funds		Other Investments	
	Current Year	Previous Year	Current Year	Previous Year
1. Interest				
a. On Government Securities	-	-	-	-
b. Other Bonds/Debentures	-	-	-	-
2. Interest on Term Deposits	-	-	33,74,508	38,97,617
3. Income accrued but not due on Term Deposits/ Interest bearing advances to employees	-	-	-	-
4. Interest on Savings Bank Accounts	-	-	-	-
5. Others (Specify)	-	-	-	-
Total	-	-	33,74,508	38,97,617
Transferred to Earmarked/Endowment Funds	-	-		
Balance	-	-		

Note:

Interest accrued but not due on Term Deposits from HBA fund, conveyance advance fund and Computer Advance fund and on interest bearing advances to employees will be included here (Item 3), only where Revolving funds (EMF) for such advances have been set up.

SCHEDULE 12 - INTEREST EARNED

[Amount in ₹]

Particulars	Current Year	Previous Year
1. On Savings Accounts with scheduled banks	4,16,190	6,57,020
2. On Loans		
a. Employees/Staff	-	-
b. Others	-	-
3. On Debtors and Other Receivables	-	-
Total	4,16,190	6,57,020

Notes:

- The amount against item 1, in respect of Bank Accounts of Earmarked/Endowment Funds is dealt with in Schedule 11 (First Part) and Schedule 2.
- Item 2(a) is applicable only if Revolving funds have not been constituted for such advances.

SCHEDULE 13 - OTHER INCOME

[Amount in ₹]

	Current Year	Previous Year
A. Income from Land & Buildings		
1. Hostel Room Rent	-	-
2. License fee	1,85,870	2,07,221
3. Hire Charges of Auditorium/Play ground/Convention Centre, etc	-	-
4. Electricity charges recovered	-	-
5. Water charges recovered	-	-
6. House Rent - Staff	-	-
Total	1,85,870	2,07,221
B. Sale of Institute's publications	-	-
C. Income from holding events		
1. Gross Receipts from annual function/ sports carnival	-	-
Less: Direct expenditure incurred on the annual function/ sports carnival	-	-
2. Gross Receipts from fetes	-	-
Less: Direct expenditure incurred on the fetes	-	-
3. Gross Receipts for educational tours	-	-
Less: Direct expenditure incurred on the tours	-	-
4. Overhead Charges	2,44,000	-
Total	2,44,000	-
D. Others		
1. Income from consultancy	-	-
2. RTI fees	360	110
3. Income from Royalty	-	-
4. Sale of application form (recruitment)	8,81,070	2,94,855
5. Misc. receipts (Sale of tender form)	55,325	27,950
6. Profit on Sale/disposal of Assets	-	-
a) Owned assets	-	-
b) Assets received free of cost	-	-
7. Grants/Donations from Institutions, Welfare Bodies and International Organizations	-	-
8. Others		
a) Miscellaneous	2,56,476	79,880
b) External Scholarship	-	1,00,000
Total	11,93,231	5,02,795
Grand Total (A+B+C+D)	16,23,101	7,10,016

SCHEDULE 14 - PRIOR PERIOD INCOME

[Amount in ₹]

Particulars	Current Year	Previous Year
1. Academic Receipts	-	-
2. Income from Investments	-	-
3. Interest earned	-	-
4. Other Income	-	-
Total	-	-

SCHEDULE 15 - STAFF PAYMENTS & BENEFITS (ESTABLISHMENT EXPENSES)

[Amount in ₹]

	Current Year			Previous Year		
	Plan	Non Plan	Total	Plan	Non Plan	Total
a) Salaries and Wages	7,89,40,425	-	7,89,40,425	5,45,25,677	-	5,45,25,677
b) Allowances and Bonus	-	-	-	-	-	-
c) Contribution to Provident Fund	-	-	-	32,96,224	-	32,96,224
d) Contribution to Other Fund (specify)	-	-	-	-	-	-
e) Staff Welfare Expenses	-	-	-	-	-	-
f) Retirement and Terminal Benefits	1,34,53,538	-	1,34,53,538	2,97,641	-	2,97,641
g) LTC facility	5,79,588	-	5,79,588	-	-	-
h) Medical facility	-	-	-	-	-	-
i) Children Education Allowance	2,93,789	-	2,93,789	-	-	-
j) Honorarium	-	-	-	-	-	-
k) Others - Medical Expenses	15,97,760	-	15,97,760	4,64,847	-	4,64,847
Total	9,48,65,100	-	9,48,65,100	5,85,84,389	-	5,85,84,389

SCHEDULE 16 - ACADEMIC EXPENSES

[Amount in ₹]

	Current Year			Previous Year		
	Plan	Non Plan	Total	Plan	Non Plan	Total
a) Laboratory expenses	-	-	-	-	-	-
b) Field work/Participation in Conferences	-	-	-	-	-	-
c) Expenses on Seminars/Workshops	-	-	-	-	-	-
d) Payment to visiting faculty	-	-	-	-	-	-
e) Examination	-	-	-	-	-	-
f) Student Welfare expenses	-	-	-	-	-	-
g) Admission expenses	-	-	-	-	-	-
h) Convocation expenses	16,02,853	-	16,02,853	22,99,509	-	22,99,509
i) Publications	-	-	-	-	-	-
j) Stipend/means-cum-merit scholarship	1,94,48,198	-	1,94,48,198	59,83,418	-	59,83,418
k) Subscription Expenses	-	-	-	76,21,039	-	76,21,039
l) Others						
i) Recurring Contingency	27,29,396	-	27,29,396	5,69,954	-	5,69,954
ii) Students Activities	24,33,192	-	24,33,192	9,74,949	-	9,74,949
iii) Other Academic Activities	46,84,786	-	46,84,786	23,10,805	-	23,10,805
iv) Consumables	7,98,608	-	7,98,608	20,33,729	-	20,33,729
Total	3,16,97,033	-	3,16,97,033	2,17,93,403	-	2,17,93,403

SCHEDULE 17 - ADMINISTRATIVE AND GENERAL EXPENSES

[Amount in ₹]

	Current Year			Previous Year		
	Plan	Non Plan	Total	Plan	Non Plan	Total
A Infrastructure						
a) Electricity and power	37,41,582	-	37,41,582	11,00,590	-	11,00,590
b) Water charges	-	-	-	-	-	-
c) Insurance	-	-	-	-	-	-
d) Rent, Rates and Taxes (including property tax)	3,48,39,308	-	3,48,39,308	2,42,64,770	-	2,42,64,770
B Communication						
e) Postage and Telegram	-	-	-	-	-	-
f) Telephone, Fax and Internet Charges	33,98,981	-	33,98,981	6,58,429	-	6,58,429
C Others						
g) Printing and Stationery (consumption)	-	-	-	-	-	-
h) Travelling and Conveyance Expenses/TA/DA	9,24,652	-	9,24,652	14,17,500	-	14,17,500
i) Hospitality	-	-	-	-	-	-
j) Auditors Remuneration	-	-	-	3,22,260	-	3,22,260
k) Professional Charges	-	-	-	-	-	-
l) Advertisement and Publicity	-	-	-	-	-	-
m) Magazines & Journals	-	-	-	-	-	-
n) Others (as per details below)						
Contingencies	9,89,161	-	9,89,161	15,94,921	-	15,94,921
Recruitment Expenses	21,00,820	-	21,00,820	20,81,538	-	20,81,538
Miscellaneous Expenses	31,86,923	-	31,86,923	24,09,052	-	24,09,052
Communication and Transportation	-	-	-	1,14,92,280	-	1,14,92,280
Total	4,91,81,427	-	4,91,81,427	4,53,41,340	-	4,53,41,340

SCHEDULE 18 - TRANSPORTATION EXPENSES

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Plan	Non Plan	Total	Plan	Non Plan	Total
1 Vehicles (owned by Institution)						
a) Running expenses	-	-	-	-	-	-
b) Repairs & maintenance	-	-	-	-	-	-
c) Insurance expenses	-	-	-	-	-	-
2 Vehicles taken on rent/lease						
a) Rent/lease expenses	90,88,780	-	90,88,780	-	-	-
3 Vehicle (Taxi) hiring expenses						
	-	-	-	-	-	-
Total	90,88,780	-	90,88,780	-	-	-

SCHEDULE 19 - REPAIRS & MAINTENANCE

[Amount in ₹]

Particulars		Current Year			Previous Year		
		Plan	Non Plan	Total	Plan	Non Plan	Total
a)	Buildings	-	-	-	-	-	-
b)	Furniture & Fixtures	-	-	-	-	-	-
c)	Plant & Machinery	-	-	-	-	-	-
d)	Office Equipment	-	-	-	-	-	-
e)	Computers	-	-	-	-	-	-
f)	Laboratory & Scientific equipment	-	-	-	-	-	-
g)	Audio Visual equipment	-	-	-	-	-	-
h)	Cleaning Material & Services	-	-	-	-	-	-
i)	Book binding charges	-	-	-	-	-	-
j)	Gardening	-	-	-	-	-	-
k)	Estate Maintenance	-	-	-	-	-	-
l)	Others - Security and Cleaning	1,22,63,500	-	1,22,63,500	91,58,341	-	91,58,341
m)	Others - Repairs and Maintenance	78,31,324	-	78,31,324	93,85,353	-	93,85,353
Total		2,00,94,824	-	2,00,94,824	1,85,43,694	-	1,85,43,694

SCHEDULE 20 - FINANCE COSTS

[Amount in ₹]

Particulars		Current Year			Previous Year		
		Plan	Non Plan	Total	Plan	Non Plan	Total
a)	Bank charges	4,811	-	4,811	1,59,388	-	1,59,388
b)	Others (specify)	-	-	-	-	-	-
Total		4,811	-	4,811	1,59,388	-	1,59,388

Note:

If the amount is not material, the head Bank charges could be omitted and these could be accounted as Administrative expenses in Schedule 17.

SCHEDULE 21 - OTHER EXPENSES

[Amount in ₹]

Particulars		Current Year			Previous Year		
		Plan	Non Plan	Total	Plan	Non Plan	Total
a)	Provision for Bad and Doubtful Debts/Advances	-	-	-	-	-	-
b)	Irrecoverable Balances Written - off	-	-	-	-	-	-
c)	Grants/Subsidies to other institutions/organizations	-	-	-	-	-	-
d)	Others (specify)	-	-	-	-	-	-
Total		-	-	-	-	-	-

Note:

Other expenses shall be classified as writes - off, provisions, miscellaneous expenses, loss on sale of investments, loss of fixed assets and loss on sale of fixed assets etc and disclosed accordingly.

SCHEDULE 22 - PRIOR PERIOD EXPENSES

[Amount in ₹]

Particulars	Current Year			Previous Year		
	Plan	Non Plan	Total	Plan	Non Plan	Total
1 Establishment expenses	-	-	-	-	-	-
2 Academic expenses	-	-	-	-	-	-
3 Administrative expenses	-	-	-	-	-	-
4 Transportation expenses	-	-	-	-	-	-
5 Repairs & Maintenance	-	-	-	-	-	-
6 Communication and Transport	-	-	-	33,48,982	-	33,48,982
6 Depreciation	-	-	-	5,69,857	-	5,69,857
Total	-	-	-	39,18,839	-	39,18,839

SCHEDULE 23 - Significant Accounting Policies**1. BASIS OF ACCOUNTING:**

The financial statements have been prepared under the historical cost convention and on accrual basis except stated otherwise.

2. FORMAT OF ACCOUNTS:

The Accounts have been prepared on the basis of Revised Format of Accounts of Central Education Institutions prescribed by Government of India, Ministry of Human Resource Development, Department of Higher Education.

3. REVENUE/ EXPENDITURE RECOGNITION:

- Fees from Students (except Tuition Fees), Sale of Admission Forms, Royalty and Interest on Savings Bank account are accounted on cash basis.
- Income from Land, Buildings and Other Property and Interest on Investments are accounted on accrual basis.

4. FIXED ASSETS:

Fixed Assets are stated at cost of acquisition inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisition.

5. DEPRECIATION:

Depreciation on fixed Assets has been provided on Straight line method at the rates given in the below table.

Tangible Assets:		
1.	Land	0%
2.	Site Development	0%
3.	Buildings	2%
4.	Roads & Bridges	2%
5.	Tube Wells & water Supply	2%
6.	Sewerage & Drainage	2%
7.	Electrical Installation and Equipment	5%
8.	Plant & Machinery	5%
9.	Scientific & Laboratory Equipment	8%
10.	Office Equipment	7.5%
11.	Audio Visual Equipment	7.5%
12.	Computer & Peripherals	20%
13.	Furniture, Fixture & Fittings	7.5%
14.	Vehicles	10%
15.	Library Books & Scientific Journals	10%
16.	Sports Equipments	10%

Intangible Assets (amortization):		
1.	E-Journals	40%
2.	Computer Software	40%
3.	Patents & Copyrights	9years

Depreciation is provided for the whole year on additions during the year.

6. INTANGIBLE ASSETS:

Patents and copy rights, E Journals and Computer Software are grouped under Intangible Assets.

- Electronic Journals (E-Journals) are separated from Library Books in view of the limited benefit that could be derived from the on-line access provided. E-journals are not in a tangible form, but temporarily capitalized and in view of the magnitude of expenditure and the benefit derived in terms of perpetual knowledge acquired by the Academic and Research Staff; Depreciation is provided in respect of E-journals at a higher rate of 40% as against depreciation of 10% provided in respect of Library Books.
- Expenditure on acquisition of software has been separated from computers and peripherals, as apart from being intangible assets, the rate of obsolescence in respect of these is very high. Depreciation is provided in respect of software at a higher rate of 40% as against depreciation of 20% provided in respect of Computers & Peripherals.

7. INTERNAL RESOURCES FUND:

Registration and admission related fee from students is transferred to Internal Resources Fund. The Internal Resources Fund is utilized for expenditure as laid down by the Executive Council of the Institution from time to time.

8. GOVERNMENT GRANTS:

- Government Grants are accounted on realization basis. However, where a sanction for release of grant pertaining to the financial year is received before 31st March and the grant is actually received in the next financial year, the grant is accounted on accrual basis and an equal amount is shown as recoverable from the Grantor.
- To the extent utilized towards capital expenditure, (on accrual basis) government grants are transferred to the Capital Fund.
- Government grants for meeting Revenue Expenditure (on accrual basis) are treated, to the extent utilized, as income of the year in which they are realized.
- Unutilized grants (including advances paid out of such grants) are carried forward and exhibited as a liability in the Balance Sheet.

9. SPONSORED PROJECTS:

In respect of ongoing Sponsored Projects, the amounts received from sponsors are credited to the head "Current Liabilities and Provisions -Current Liabilities -Other Liabilities -Receipts against ongoing sponsored projects." As and when expenditure is incurred /advances are paid against such projects, or the concerned project account is debited with allocated overhead charges, the liability account is debited.

10. INCOME TAX:

The income of the Institution is exempt from Income Tax under Section 10(23C) of the Income Tax Act. No provision for tax is therefore made in the accounts.

SCHEDULE 24 - Contingent Liabilities and Notes to Accounts

1. Contingent liabilities and capital commitments:

	(Amount In ₹ Lakhs)	
	Current Year	Previous Year
a) Claims against the Institute not acknowledged as debts	-	-
b) Capital Commitments (net of advances)	42047.20	638.27

- Balance of unutilized grant brought forward from the previous year amounting to ₹19,84,77,809/- which was included under Capital Fund has been deducted from Capital Fund (Schedule – 1) and transferred to Current Liabilities (Schedule – 3).
- The recalculation of depreciation retrospectively since inception pursuant to the change in the method of depreciation has resulted in addition of the Capital Fund by ₹94,82,781/- with corresponding impact in the net value of fixed assets to that extent.
- Grant in aid of ₹20,00,00,000/- pertaining to the current year received after 31.03.2016 has been shown as Grants Receivable

5. Expenditure in Foreign Currency:

Particulars	Amount (in ₹ Lakhs)
Software	2.09
Journals and Subscriptions	222.47
Total	224.56

- Purchases of Printing & Stationery and other consumable items during the year are treated as expenditure and charged to appropriate Revenue heads.
- In the opinion of the Management, the current assets, loans and advances have a value on realization equal or at least to the aggregate amount shown in the Balance Sheet.
- Previous years figures have been rearranged and regrouped wherever considered necessary to facilitate comparison.
- Figures in the Final accounts have been rounded off to the nearest rupee.
- Schedules I to 24 are annexed to and form an integral part of the Balance Sheet at 31st March 2016 and the Income & Expenditure account for the year ended on that date.

For National Institute of Technology Meghalaya

Director

Assistant Registrar

ANNEXURE A : DETAILS OF EMD & SECURITY DEPOSIT AS ON 31-03-2016

[Amount in ₹]

S.No	Name of the Firm / Company	Amount
1	Earnest Money Deposit	42,67,826
2	Security Deposit - Contractors and Suppliers	44,36,951
	Total	87,04,777

ANNEXURE B : DETAILS OF STATUTORY LIABILITIES AS ON 31-03-2016

[Amount in ₹]

Sl.No.	Particulars	Amount
1	TDS - Contracts	6,20,857
2	TDS - Pay and Allowances	2,500
3	VAT	5,02,769
4	Forest Royalty	692
5	Labour Cess	863
6	Professional Tax	2,30,550
7	Service Tax	5,656
		13,63,887

ANNEXURE C : DETAILS OF OTHER LIABILITIES AS ON 31-03-2016

[Amount in ₹]

Sl.No.	Particulars	Amount
1	NIT Mess Account	1,94,000
2	Tuition Fee Refundable to SC/ST	40,300
3	Excess Fee Refundable	5,86,631
4	PhD Fee Refundable	9,100
5	Stale Cheques	8,750
6	SVNIT Surat	1,24,375
7	Suspense Account	2,28,408
8	CSAB Administrative Charges	1,25,283
9	B. Tech Remuneration	42,000
10	Other Current Liabilities	1,22,12,712
11	Returned Cheques	4,29,955
12	NMEICT	14,166
13	Current Liabilities(CE/01)	3,48,000
14	Current Liability (SDMA)	80,000
		1,44,43,680

ANNEXURE D : DETAILS OF UTILIZATION OF PLAN FUNDS FOR THE YEAR ENDED 31ST MARCH 2016

[Amount in ₹]

	FUND WISE BREAK UP										Previous Year
	PLAN FUND 112-31	PLAN FUND 112-35	PLAN FUND 112-36	PLAN FUND 789-31	PLAN FUND 789-35	PLAN FUND 789-36	PLAN FUND 796-31	PLAN FUND 796-35	PLAN FUND 796-36	Total	
a) Opening balance of funds	9,27,06,361	5,16,23,600	-	-	4,29,84,898	-	-	1,11,62,950	-	19,84,77,809	15,34,09,985
b) Additions to the funds											
Grants	77,00,000	35,76,00,000	77,00,000	15,00,000	9,04,00,000	15,00,000	8,00,000	1,23,75,000	8,00,000	48,03,75,000	60,00,00,000
IRG	1,31,01,699	-	-	-	-	-	-	-	-	1,31,01,699	1,09,06,803
Total (a + b)	11,35,08,060	40,92,23,600	77,00,000	15,00,000	13,33,84,898	15,00,000	8,00,000	2,35,37,950	8,00,000	69,19,54,508	76,43,16,788
c) Utilisation/ Expenditure towards objectives of funds											
i. Capital Expenditure	-	24,14,69,829	-	-	4,67,36,096	-	-	2,33,68,048	-	31,15,73,973	41,82,66,323
Total	-	24,14,69,829	-	-	4,67,36,096	-	-	2,33,68,048	-	31,15,73,973	41,82,66,323
ii. Revenue Expenditure	11,35,08,060	7,05,86,617	77,00,000	15,00,000	-	15,00,000	8,00,000	-	8,00,000	19,63,94,677	14,75,72,656
Total	11,35,08,060	7,05,86,617	77,00,000	15,00,000	-	15,00,000	8,00,000	-	8,00,000	19,63,94,677	14,75,72,656
Total (c)	11,35,08,060	31,20,56,446	77,00,000	15,00,000	4,67,36,096	15,00,000	8,00,000	2,33,68,048	8,00,000	50,79,68,650	56,58,38,979
Net balance as at the year end (a + b - c)	-0	9,71,67,154	-	-	8,66,48,802	-	-	1,69,902	-	18,39,85,858	19,84,77,809

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2016

[Amount in ₹]

RECEIPTS		Current Year	Previous Year	PAYMENTS		Current Year	Previous Year
I.	Opening Balance			I.	Expenses		
	a) Cash Balances	-	-		a) Establishment Expenses	8,63,27,802	5,85,84,389
	b) Bank Balance				b) Academic Expenses	3,16,97,033	2,17,93,403
	i. In Current accounts	4,41,51,593	4,07,91,433		c) Administrative Expenses	4,91,81,427	4,53,41,340
	ii. In Deposit accounts	3,00,00,000	6,00,00,000		d) Transportation Expenses	90,88,780	-
	iii. Savings accounts	1,34,59,821	2,26,73,621		e) Repairs & Maintenance	2,00,94,824	1,85,43,694
II.	Grants Received				f) Prior period expenses	-	33,48,982
	a) From Government of India	48,03,75,000	60,00,00,000		g) Finance Cost	4,811	1,59,388
	b) From State Government	-	-	II.	Payments against Earmarked/ Endowment Funds	-	-
	c) From others	-	-	III.	Payments against Sponsored Projects/Schemes	1,45,16,989	-
				IV.	Payments against Sponsored Fellowships/Scholarships	4,60,250	-
				V.	Investments and Deposits made		
III.	Academic Receipts	76,87,900	1,87,87,900		a) Out of Earmarked/ Endowments funds	-	-
IV.	Receipts against Earmarked/ Endowment Funds	-	-		b) Out of own funds (Investments- Others}	-	-
V.	Receipts against Sponsored Projects/Schemes	2,37,06,489	-	VI.	Term Deposits with Scheduled Banks	-	-
VI.	Receipts against sponsored Fellowships and Scholarships	9,02,745	-	VII.	Expenditure on Fixed Assets and Capital Works - in- Progress		
VII.	Income on Investments from				a) Fixed Assets	9,77,31,040	40,97,63,987
	a) Earmarked/Endowment funds	-	-		b) Capital Works- in- Progress	21,38,42,933	85,56,079
	b) Other investments	-	-	VIII.	Other Payments including statutory payments	-	-
VIII.	Interest received on						
	a) Bank Deposits	33,74,508	38,97,617	IX.	Refunds of Grants		
	b) Loans and Advances			X.	Deposits and Advances	4,24,67,132	10,68,28,977
	c) Savings Bank Accounts	4,16,190	6,57,020	XI.	Other Payments	-	-
IX.	Investments encashed	-	-	XII.	Closing balances		
X.	Term Deposits with Scheduled Banks encashed	-	-		a) Cash in hand	-	-
XI.	Other income (including Prior Period Income)	16,23,101	7,10,016		b) Bank balances		
XII.	Deposits and Advances	2,24,82,888	1,30,14,046		In Current Accounts	3,16,83,516	4,41,51,593
XIII.	Miscellaneous Receipts including Statutory Receipts	-	-		In Savings Accounts	2,01,42,170	1,34,59,821
XIV.	Any Other Receipts - Capital Work in Progress refund	-	-		In Deposit Accounts	1,09,41,528	3,00,00,000
TOTAL		62,81,80,235	76,05,31,653	TOTAL		62,81,80,235	76,05,31,653

For NIT Meghalaya

Director

Assistant Registrar



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